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FOOD VALUES AND RATIONS.

*By B. A. Barr, Senior Dairy Supervisor.*

The total amount of essential constituents in cattle food determined by chemical analysis does not give any definite information of their respective food values. It serves to show in what proportions the constituents are present, but it does not reveal whether they are in a condition to be readily digested, nor does a scrutiny of the figures convey any knowledge of that amount of nourishment available for animal nutrition.

Nevertheless, a chemical analysis is the first step to a comparison of relative food values, and the average obtained from a large number of samples is taken to represent the average composition of any particular variety of foodstuff. As a result of feeding trials, the percentages of digested protein, carbohydrates, and fat—called digestible nutrients—are found. This data furnishes coefficients of digestion, which find application in general practice. In addition to a knowledge of the amounts of digestible nutrients in any food, it is important to know the cost of digestion, *i.e.*, the amount of energy expended in rendering the digestive matter to an assimilable state, as shown in Table I. The energy expended in digestion reduces the value of the digested materials by the amount used, and the difference between the total energy of the digestible foodstuff and that used in digestion is net gain to the animal, which may be used for milk production. The cost of digestion varies according to class of foodstuff. Green grass is more easily digested than dry grass. Hay cut on green side is more easily digested than hay cut almost ripe. Pollard is more easily digested than bran. Crushed oats are more easily digested than whole oats.

Some of the factors which influence the cost of digestion are, the variety of food, its chemical and physical condition. A food in a finely-divided state is digested at a lower cost than some of the same variety in a coarse state. The stage of growth at which hays are cut influences both the digestibility and cost of digestion; as the plant ripens the

percentage of crude fibre increases, thus rendering digestion both more costly and slower. The more slowly digestion proceeds the greater will be the loss from fermentation.

The cost of digestion must not be confused with the digestibility of a food.

Digestibility regulates the proportion digested, which is the difference between the amount consumed and the solid manure. The cost of digestion is a charge made against the food in changing it from the undigested to the digested condition.

TABLE I.  
STARCH EQUIVALENTS.

	In original sample.	Digested.	Available for use after deducting cost of digestion.	Percentage of original.
Bran .. ..	90	58	48	55
Oats .. ..	99	70	64	64
Lucerne hay ..	85	51	33	39
Oaten hay ..	90	45	30	33
Oat straw ..	82	40	16	19

The above table must not be used to compare the relative values of the foods included. It serves only to compare the amounts of food substances—reduced to a starch equivalent—in the original food with that which is available for use of the animal.

Using as an illustration the two extremes—oats and oaten straw—it will be noticed that from 99 starch equivalents in oats, 64, or 64 per cent., represent net gain; 82 starch equivalents in oaten straw, 16, or 19 per cent., represent net gain.

In the case of the former, 34 per cent is not available, due partly to a portion being indigestible, and partly to the energy consumed in digestion, whilst the latter shows a loss of 71 per cent. from the same causes, but largely owing to the heavy expenditure in digestion.

A striking example is afforded in the following, which demonstrates the value of silage, and provides a reason for what has frequently been proved in practice:—

#### ORIGINAL FOODSTUFFS.

	Protein. %	Crude Fibre. %	Carbohydrate. %	Fat. %	Starch equivalents.
Oaten hay ..	6	20	53	4.0	90
Oaten silage ..	3	9	21	1.5	37

#### DIGESTIBLE NUTRIENTS.

	Protein.	Crude Fibre.	Carbohydrate.	Fat.	Starch equivalents.
Oaten hay ..	3.5	9	28	2.5	45
Oaten silage ..	2.0	6	15	1.0	26

#### NET AMOUNT AVAILABLE FOR NUTRITION.

##### Digestible—Cost of Digestion.

	Protein.	Carbohydrate.	Fat.	Starch equivalents.
Oaten hay ..	2.5	26	2.0	30
Oaten silage ..	1.6	17	.8	20

Comparison by the use of the starch equivalent, although unsatisfactory, is perhaps the best system in use at present, provided comparisons are restricted to members of natural groups, as green fodder and hays, grains, mill products, oil meals. The 30 net starch equivalents contained in 100 lbs. of hay may be compared with 20 in oaten silage. provided each is of good quality, and the deduction that 1 lb. oaten hay equals  $1\frac{1}{2}$  lbs. silage is supported by practice. In fact, when a scarcity of green feed prevails, the value of silage is greater, owing to its succulence. To compare the starch equivalents of bran with those of the oil meals or hay is incorrect, and would lead to wrong conclusions, because the three substances named differ greatly in composition and belong to separate groups. When the protein and carbohydrate are used to perform similar functions, viz., heat production, the use of starch equivalents may be made to all classes of foodstuffs.

For this purpose protein is too expensive, and when used, as they should be, in the performance of dissimilar functions, viz., protein for development, repair of tissue and milk secretion, carbohydrate and fat for production of heat and formation of fat, no comparison between the nitrogenous and non-nitrogenous constituents is possible. For this reason cattle foods are arranged in groups.

*Hays*.—To provide the nutrients necessary for maintenance when grasses or green fodder are insufficient for the total food supply, when only a small quantity of milk is yielded.

*Grasses, Clovers, and Green Fodder*.—To supply sufficient to meet all needs.

*Concentrates*.—To provide sufficient nutrients for milk supply when a deficiency occurs in natural pasture.

In practice no attention need be given to the analysis of ordinary green crops or hays, inasmuch as the analyses show that wide variations are greatest amongst individual samples of the same variety. Season, soil, climate, manure, farming practice, and stage of growth are all factors which influence the value of green fodders and hay. The following may be accepted as generalized statements:—Lucerne hay makes the best roughage, then follow clover, mixed grass, and cereal hays, when grown and harvested under favorable conditions. Green oats are preferred by cows to green barley, and have also a higher value for milk production. Barley grows more vigorously in the early stages of growth than oats.

Hays cut green are more nutritious than hays cut at a later period. Millet is superior to maize for milking cows. Maize yields a heavier crop and makes excellent silage.

#### VICTORIAN ANALYSIS OF CONCENTRATES.

(Showing percentages of nutrients available for milk production.)

Foodstuff.	Protein.	Carbo- hydrate.	Fat.	Total starch equivalent.	Nutritive ratio.	Price.	Cost per lb.
	%	%	%				d
Oats ..	8.5	43	4	64	1:6	2s. 6d. per bushel	.75
Barley ..	9	64	2	80	1:8	3s. 6d. "	.8
Maize ..	7	66	4	85	1:11	5s. "	1.0
Bran ..	9	32	2	48	1:4	£5 per ton	.6
Pollard ..	10	55	3	75	1:6	£6 "	.7
Polly feed ..	14	52	2	75	1:4	£5 "	.6
Unsweet oil meal	26	32	9	37	1:2	£10 "	1.2
Coconut oil cake	19	42	5	78	1:3	£12 "	1.3

The above table comprises standard concentrates. There are many others in the market, particularly mill offals, but owing to the great variations in composition, their inclusion is unwarranted. Where the feeder is obtaining good results from their use, he should continue; but, if frequent fluctuations are noticed in the results, it would be advisable to discontinue and make use of some concentrate more constant in value.

The amount of net available nutrients in a food does not of itself fix the food value, even when different foods are obtainable at the same price. The palatability and quantities which may be fed without causing digestion troubles are important factors. Excessive quantities of oil meals should at all times be avoided, and a lesser quantity given in summer than in winter. A mixture of concentrates is preferable to the sole use of any particular one.

In selecting rations for dairy cows under local conditions, a difficulty arises in determining both the amount and quality of feed obtained in the paddock; whether it is sufficient to enable the cow to produce her maximum quantity of milk or only a portion of it. If sufficient is obtained in the paddock, then any addition is unnecessary, but if the paddock feed is only sufficient to produce 2 gallons daily and the cow can on suitable feed produce 3 gallons, then it will be profitable—when prices for butter fat and concentrate are normal—to supplement the feed with the requisite amount of foodstuff. The dairy cow is always most profitable when yielding her maximum. It is not an easy matter to tell when the individual members of a herd are producing their maximum amount of milk. Sometimes, condition acts as a rough guide. Cows putting on fat without increasing the flow of milk may be regarded as producing their best. The lower yielding cows may be compared with the higher. If in the same herd some cows are producing 4 gallons, one can readily assume that those giving 3 gallons on the same food and under equal conditions are not likely to profitably increase on receiving additional food. When a cow is losing condition it is a sure indication that her food supply is insufficient and should be increased, particularly by the addition of concentrates. This does not apply to fat newly-calved cows, and conversely where hand-feeding is practised, the putting on of fat should be regarded as a sign that the animal—from a milking view—is not making the most profitable use of her food, which should accordingly be reduced, unless it be for a drying cow to build up in preparation for the ensuing season.

The first question to be considered in the feeding of milking cows is: Are they yielding their maximum amount of milk? If not, what kind and quantity of feed are necessary for them to do so, and will it pay to provide the amounts? The first question can only be answered by increasing the feed and noting the result, the second by a consideration of the increase expected, the prices and food values of common cattle foods.

The food of a milking cow is used for two purposes—

1. *Maintenance.*—The upkeep of the body and development of the fetus or unborn calf.

2. *Milk Secretion.*—The amount of food nutrients required for the maintenance of an average cow is—protein .5 lbs., carbohydrate 5 lbs., as determined from the average analysis of locally-grown foodstuffs. The above amounts were found by the writer to be sufficient for in-calf cows

during the past drought in two herds under observation, when the whole of the food consumed was hand-fed.

In a cold district a slightly increased amount would be necessary.

15 lbs. of good cereal hay contain the above amount, and for general application may be regarded as sufficient for maintenance.

The maintenance or basal part of the ratio should be supplied as hay, green fodder, or silage, and that required for milk production as concentrates.

A guide to the amount of food required for milk secretion may be obtained from a scrutiny of the composition of average milk.

#### AVERAGE COMPOSITION OF 4 PER CENT. MILK.

Protein.	Carbohydrate.	Fat.	Starch equivalent of fat and milk sugar.
3.4 %	4.7 %	4 %	14.7
.034 lb.	.047 lb.	.04 lb.	.147 lb.

Nutritive ratio, 1 : 4

The nutrients of the food are transformed into the nutrients of milk, and since the protein of the milk can only result from the protein of the food, .034 lb. of vegetable protein is essential for each lb. of milk secreted. But owing to variations in composition of foods and for other reasons outside the scope of this article, the minimum in general practice should not be less than .045 lbs. protein and .15 lbs. carbohydrate (the fat or ether extract is reduced to its carbohydrate equivalent) for each lb. of milk in addition to the allowance for maintenance. A simpler method suitable for general practice is to allow 1 lb. of mixed concentrate made from some of the following—bran, polly feed, oats, linseed meal, pollard, coconut oil cake—for each 2½ lbs. to 3 lbs. of milk, according to quality of milk:—

#### SUITABLE PROPORTIONS FOR MIXTURE.

Bran ..	300	Crushed oats..	250	Bran ..	300
Polly feed ..	200	Bran ..	250	Polly feed ..	200
Oil meal ..	75	Oil meal ..	75	Pollard ..	150

When the paddock feed is insufficient for milking cows, though perhaps sufficient to keep dry ones in good condition, it is inadvisable to fill the milkers with chaff or hay. Concentrates are wanted. The oft-repeated saying "that hay causes the cows to dry off" is not due to any principle in the hay producing this effect, but is due to the fact that hay or chaff alone does not contain sufficient nourishment to supply the heavy demand made by the milking cow. A cow yielding 4 gallons of milk daily uses about 35 per cent. of the nutrients in her food for maintenance, the remaining 65 per cent. are utilized in milk production, whilst of the protein alone only 20 per cent. goes for maintenance and 80 per cent. for milk. It is hoped that whilst prices remain as at present dairy-farmers will take the opportunity of getting the most out of the cows by the general use of concentrates. It pays to give the best to good cows; to the other kind it does not pay to give anything. At current rates (August), 1 lb. of bran or polly feed costs 6d., and the same amount of oil meal 1.2d., whilst 2½ lbs. of 4 per cent. milk is worth 2d. for separation and 3.3d. for town milk supply.

The following rations were used by various dairymen during June, July, and August. The nutritive contents, based on the average composition of local foolstuffs, are given in detail to illustrate the relative values

of the rations. It will be noticed that the amount of milk produced from 1 lb. of concentrates varies according to the richness of the feed. In every case the herds comprise mixed cows in all stages of lactation.

## No. 1.

## SITUATED NEAR MELBOURNE.

June, 1916—66 cows; daily average, 19½ lbs.; best cow, 48 lbs.

Average Ration.	Protein.	Carbohydrate.	Fat.	Price. per ton.	Cost per cow per day.
	%	%	%	£ s. d.	d.
7 lbs. bran ..	.63	2.24	.14	5 0 0	4.2
1½ lbs. polly feed	.21	.78	.03	5 5 0	.9
	<u>.84</u>	<u>3.02</u>	<u>.17</u>		<u>5.1</u>
16 lbs. chaff ..	..	..	..	3 10 0	6.0
					<u>11.1</u>

Notes.—No paddock feed, except 2 bales lucerne hay at night. Milk sold wholesale.

The cost of chaff for maintenance is greater than cost of concentrates for milk production. Concentrates cost 2.6d. per gallon. Total feed costs 5.6d. per gallon. Cows yielding over 2 gallons receive a proportionate increase of feed.

July—70 cows; daily average, 20 lbs.; best cow, 40 lbs. Feed—Bran increased by ½ lb; chaff increased by 1 lb., and 1 lb. branning added.

August—65 cows; daily average, 22 lbs.; best cow, 39 lbs. Feed—Bran increased to 8 lbs., otherwise feed the same as last month.

## No. 2.

## GIPPSLAND FARM.

June, 1916—9 cows; daily average, 36 lbs.; average test, 4.8 per cent.; best cow, 56 lbs.

Ration.	Protein.	Carbohydrate.	Fat.	Price. per ton.	Cost per cow per day.
	%	%	%	£ s. d.	d.
2 lbs. bran ..	.18	.64	.04	5 0 0	1.2
1 lb. linseed oil meal ..	.26	.32	.09	10 0 0	1.2
	<u>.44</u>	<u>.96</u>	<u>.13</u>		<u>2.4</u>

Note.—Grazing good crops of green oats and barley alternatively.

Concentrates cost .63d. per gallon, or 1.4d. per lb.; butter fat at 1s. 9d.

July—10 cows; daily average, 34 lbs.; average test, 5 per cent.; best cow, 52 lbs. Same feed; abundance of grass.

August—13 cows; daily average, 30 lbs.; average test, 5 per cent.; best cow, 50 lbs. Same feed. Cows rugged.

During 86 days in May, June, and July, two cows in this herd yielded respectively 4,326 lbs. of 3.9 per cent. milk, and 4,271 lbs. of 5.2 per cent. milk, averaging over that period 50 lbs. and 49½ lbs. per day. One-half of milk is separated, and the rest sent to condensing

factory. During July this herd averaged 21s. 6d. per cow weekly. Although there is an abundance of grass and green feed, concentrates are used. To use the words of the owner, concentrates put a little substance into the cow, and give her something to work upon.

## No. 3.

## NORTH-EASTERN DISTRICT FARM.

June, 1916—25 cows; daily average, 27½ lbs.; average test, 5.4 per cent.; best cow, 31 lbs. A very even herd of high testing and consistent milkers.

Ration per cow.	Protein.	Carbohydrate.	Fat.	Price. per bushel.	Cost per day per cow.
	%	%	%	£ s. d.	d.
3 lbs. crushed oats	.25	1.29	.12	0 2 1	1.8
2 lbs. polly feed	.28	1.10	.04	5 5 0	1.2
2 lbs. bran	.18	.64	.04	5 0 0	1.2
2 lbs. coconut oil cake	.38	.84	.10	12 0 0	2.6
1 lb. linseed oil meal	.26	.32	.09	10 0 0	1.2
	1.35	4.19	.39		8.0

Notes.—As much grass silage as cows will consume. Paddocks bare. Dry and young stock fed on silage to keep alive. Season very bad. Cows rugged.

No chaff given. Ration fed moistened in bails. Concentrates cost 2.6d. per gallon, or 5.2d. per lb. butter fat at 1s. 6d.

The above ration appears to be costly, but it must be remembered that without supplementary feed the silage is only sufficient to keep the dry stock in fair condition. Without the silage the stock would die, as the paddocks are too bare for sheep. Assuming the silage to be required for maintenance and the concentrates available for milk production, the cost of concentrates is 5s. 9d. per week. The butter fat return average for month 17s. 6d. per week. When the season improves the herd will be in full profit and the cost of production will be reduced considerably.

July—22 cows; daily average, 28 lbs.; average test, 5.5 per cent.; best cow, 37 lbs. Feed—same concentrates as last month. To conserve silage, a portion has been replaced with grass hay.

August—31 cows, including 12 heifers on 1st calf; daily average, 26 lbs.; average test, 5.4 per cent.

Ration per cow.	Protein.	Carbohydrate.	Fat.	Price. per bushel.	Cost per cow per day.
	%	%	%	£ s. d.	d.
3 lbs. crushed oats	.25	1.2	.12	0 2 1	1.8
2 lbs. polly feed	.28	1.1	.04	5 5 0	1.2
3 lbs. bran	.27	.96	.06	5 0 0	1.8
2 lbs. linseed oil meal	.52	.64	.18	10 0 0	2.4
	1.32	3.9	.4		7.2

Note.—Same paddock feed as last month.

By changing ration a saving of 1d. per cow daily was effected without influencing the milk yield, because the decrease from 27½ lbs. to 26 lbs. is accounted for by advanced lactation of best cows and calving of first year heifers.

*Note.*—That by selection of foods the same amount of nutrients may be obtained at reduced cost.

Concentrates cost 2.7d. per gallon.

#### No. 4.

##### SITUATED NEAR MELBOURNE.

June, 1916—20 cows; daily average, 21½ lbs.; best cow, 32 lbs.

Ration per cow.	Protein.	Carbohydrate.	Fat.	Price.	Cost per cow
	%	%	%	per ton.	per day.
				£ s. d.	d.
3½ lbs. polly feed	.5	1.82	.07	5 5 0	2.1
3 lbs. crushed oats	.25	1.29	.12	0 2 1	1.8
	.75	3.11	1.9		3.9
6 lbs. chaff	..	..	..	per ton. 3 10 0	2.25
					6.15

*Note.*—Short paddock feed, occasionally graze barley crop. Cows rugged.

Concentrates cost 1.8d. per gallon. Total feed costs 2.8d. per gallon. July—20 cows; daily average, 22 lbs.; best cow, 32 lbs. Feed changed to 3 lbs. polly feed, 2½ lbs. bran, 1½ lbs. crushed oats. Daily cost increased to 4.3d. per cow.

August—20 cows; daily average, 19 lbs. per cow. Feed increased to 4 lbs. bran, 3 lbs. polly feed, 22 lbs. crushed oats, and 7½ lbs. chaff, costing for concentrates 4.9 per cow daily, and 2.6 per gallon. The amount of milk yielded does not require this amount of concentrate. The increase is unnecessary and too costly. In June the cost of concentrates was 1.8d. per gallon on 21½ lbs. average; in August the cost has increased to 2.5 per gallon on 19 lbs. average. The paddock feed was apparently the same during each month.

#### No. 5.

##### SITUATED 30 MILES FROM MELBOURNE.

August, 1916—124 cows; daily average, 21 lbs.

Ration per cow.	Protein.	Carbohydrate.	Fat.	Cost per cow
	%	%	%	per day.
				d.
6½ lbs. bran	.58	2.08	.05	3.9
1½ lbs. linseed meal	.39	.48	.13	1.8
	.97	2.56	.18	5.7

*Notes.*—Very short paddock feed. Milk sold wholesale.

34 lbs. maize silage and 10 lbs. oaten chaff.

Concentrates cost 2.7d. per gallon.



The daily averages on the above farms were obtained in all cases, but the last from the records of weights recorded each milking, and from the gallons of milk sold during the month.

Attention is directed to the economy of changing feed in No. 3.

The suggestion is made to dairy-farmers depending during winter months on pasture and hay to try the effect of 3 lbs. to 8 lbs. concentrate per cow per day.

The amounts will be regulated by the amount of milk produced and its value. At the present time dairy products are bringing high prices, and every effort should be made to bring about profitable increases. When the herd is maintained at its maximum, not only is the output greater, but the season is longer. When all the food required to maintain a good herd producing to its full capacity throughout the season can be provided by the farm, the profits must necessarily be greater; but if at the present time the cows cannot obtain sufficient food on the farm, and will not pay for purchased foodstuffs, or do not make profitable use of food supplied by the farm, they may be classed as cows, but not dairy cows. The chief object in feeding is profit.

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WHILST many farmers complain that they have not the wherewithal to improve their land, enormous bodies of material lie wasting on unproductive areas. Ditches, so necessary to every type of farm, may be made to yield large quantities of useful soil dressings. The heavy deposits of silt, peaty and turfy matters found in hollows and by streams is to be regarded as the most substantial and profitable form of dressing for any land. The keeping of animals will insure the largest possible return to the soil, in place of that taken by the growing of crops. By these means, all of which are more or less within our power, we may actually add to the depth and value of soil, and thereby place ourselves in a better position to face droughts and bad seasons.

Crops of various kinds, be they animal or vegetable, exhaust or refresh soil in fixed proportion to the extent of their waste, and return. In warm climates it is ever an affair of bulk. Not one or all of the chemical manures can so affect the temperature and moisture-holding conditions of the soil as to facilitate the action of bacteria for more than a brief season. The actual fermenting medium must be supplied from what we may term natural sources. Green manures, bulk manures from the farmyard, surface materials, which are well charged with organic waste—these are the things to which we must eternally look if we are to create such bodies of active soil as will insure permanent occupation and profit from any piece of land. The amount to be applied may vary in degree, but sooner or later it must become exhausted, if it receives not more or less of each or all of these materials.

## APPLE CULTURE IN VICTORIA.

(Continued from page 479.)

*By J. Farrell, Orchard Supervisor.*

### LAYING OUT THE ORCHARD.

The continually increasing cost of labour, implements, and spraying materials required in the orchard, the difficulties met with in the local marketing of fruit during years of heavy crops, and the keen competition by fruit-exporting States in the world's markets, are the chief factors which should influence the fruit-grower to adopt all the modern methods which tend towards the economic working of the orchard. Amongst those, the method of planting the orchard plays a most important part.

### THE SQUARE SYSTEM OF PLANTING.

When an orchard is being laid out the trees should be planted in such a manner as to make sure of their subsequent cultivation and general management being carried out on sound commercial lines.

The square method of planting is mostly practised in this State. By this method the rows of trees are placed at right angles to the headlands. This facilitates cultivation and spraying, &c., and is generally better adapted to irrigation, whether from channels or dams, than when the trees are planted under systems which do not permit of the rows being so placed.

When the hexagon or other methods of planting, by which the rows are placed in diagonal lines to the headlands, are employed they usually prove inconvenient, and particularly where irrigation and drainage are involved.

### DISTANCE BETWEEN TREES.

Great diversity of opinions existed amongst the early growers as to the proper distance apart at which the trees should be planted. But the 16 feet by 16 feet and 18 feet by 18 feet were the distances mostly favoured.

In the light of experience and more matured knowledge, however, growers who have established commercial orchards, during recent years, almost invariably planted 20 feet by 20 feet. This represents 108 trees to the acre, and it has practically become a standard.

To find the number of trees necessary to plant an acre of land, bring one acre to square feet, and divide by the square of the distance allowed, thus—

$$\frac{4 \times 40 \times 30\frac{1}{2} \times 9}{20 \times 20} = \frac{1089}{10} \text{ or } 108\frac{9}{10} \text{ trees.}$$

The same method of working the 18 feet by 18 feet principle gives  $\frac{1210}{9}$  or 134 $\frac{2}{9}$  trees per acre.

To find the lowest number, without a fraction, of trees necessary to plant the smallest number of acres at 20 feet by 20 feet, let the numerator (1089) of the improper fraction represent the trees and

the denominator (10) the number of acres. Thus, 1,089 trees will plant 10 acres, and in the case of the 18 by 18 system, 1,210 trees will plant 9 acres.

#### FINDING THE RIGHT ANGLE.

When preparing to plant, the usual practice is to make a square with which to set out the right angle. Plate 8 shows method of constructing same on the 3, 4, and 5 principle. Secure three pieces of ordinary flooring boards 6 inches by 1 inch. One should be a 21-ft.

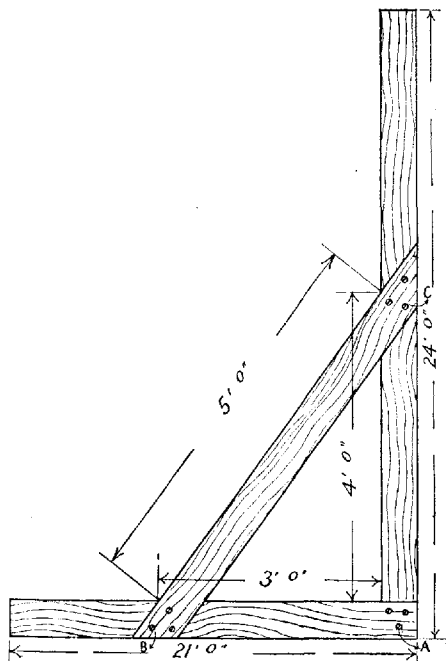


Plate 8.—To make a square for right angle.

length for the base, another 24-ft., to form the right angle, and a 7-ft. length for the diagonal. Place the base on the right-angle piece and put in screw (A). Measure 3 feet on the base, place diagonal as shown, and insert screw (B). Then measure 4 feet on the right angle and 5 feet on the diagonal as depicted, bring right-angle board and diagonal into position, and drive in screw (C). The remaining six screws may be placed in the square as shown. Provided the work is properly executed, the square will be correct.

An ordinary fencing wire, No. 8 or 10 gauge, and of sufficient length to measure the longest row of pegs in the orchard, is used in conjunction with the square to find the right angle and locate the positions of the pegs, which indicate where the trees are to be planted.

The wire is marked by soldering on a piece of finer wire at every 20 feet, or whatever distance is allowed between the trees. A loop is made at each end, about 5 feet from the end marks, into which two iron pegs or crowbars are placed to hold the wire, when fixed in position.

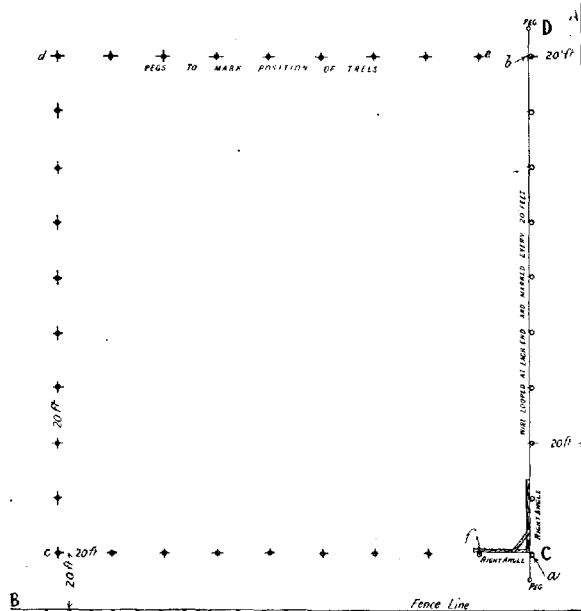


Plate 9.—Setting out the Orchard.

Plate 9 illustrates method of planting 100 trees 20 feet by 20 feet.

Peg (a) is put in 20 feet from (A) and (B) fence lines respectively. Then the wire (CD) is stretched to form the base line, the end mark on the wire is placed at (a), on the inside of the peg, and made fast by the iron pegs; when 20 feet has been measured from (B) fence line to (c), the row of pegs are then driven in. The wire is then removed to the position shown in the diagram, peg (b) is put in, and the right angle is formed by using the square as depicted. When pegs (a) to (b) are driven in the wire is removed to (b d), but before driving in (d) test with wire (c) to (d). When the proper



at (d). To complete the square for 100 pegs by finding the position of (f) and finish the pegging out, follow the directions given in connexion with Plate 9.

On account of its rapidity, simplicity, and accuracy, this is the method recommended for setting out the right angle.

Whether the method of finding the right angle and the positions of the pegs as illustrated in Plate 9 or 10 is adopted, the positions of the pegs in relation to the lines described by the wire should be uniform.

To illustrate this Plate 11 shows sixteen pegs in position. The corner one (A) is the first used, and consequently it may be regarded as the key to planting the whole orchard. The position it takes up is the most convenient in which it can be placed in relation to the

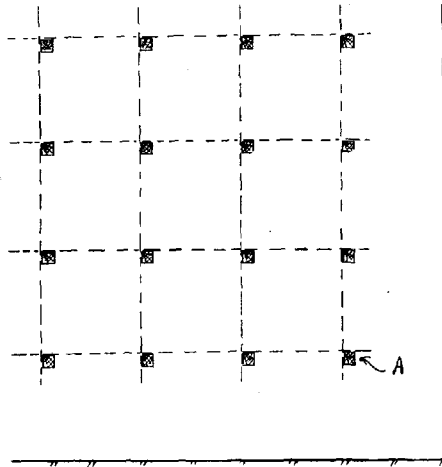


Plate 11.—Position of pegs in relation to the lines.

dotted lines, which represent those marked out by the planting wire, and the others occupy corresponding positions.

Wide headlands are advocated. They should be 20 feet, which is also recommended as the distance between the trees.

#### PLANTING IN DEPRESSIONS AND ON ELEVATIONS.

When depressions and elevations exist in the area to be planted Plate 12 illustrates, in order to obtain straight rows of trees, how these difficulties may be overcome, and the pegs placed in their proper places. Fig. 1 is the cross section of a depression over which the wire may be stretched in the usual manner from (d) to (a). Then the pegs (d c) are placed in position. A plumb line held at mark (f) on the wire will find that peg's position. Those between (f) and (e)

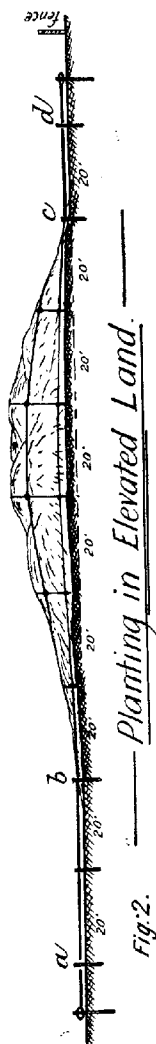
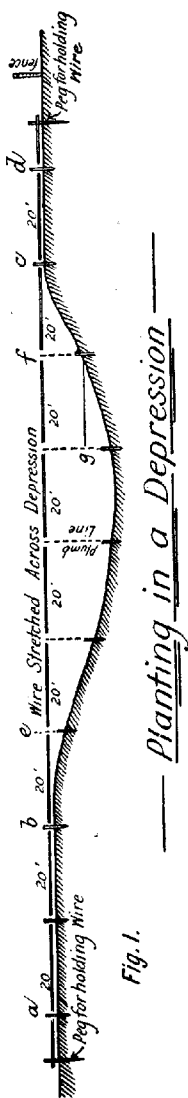


Fig. 12.—Planting in depressions and on elevated land.

may be arranged similarly. The pegs (*b*) to (*a*) being on the level are fixed in the usual manner.

Should the depression be too deep to permit of the plumb line being held to the marks on the wire, it may be stretched on the surface to describe a straight line. A 20-ft. measuring rod may be placed against peg (*f*) and plumbd at (*g*) as shown.

Plate 12, Fig. 2, is section showing elevation and illustrating simple method of pegging out the land under these conditions. All the level land around the elevated portion is first pegged out in the

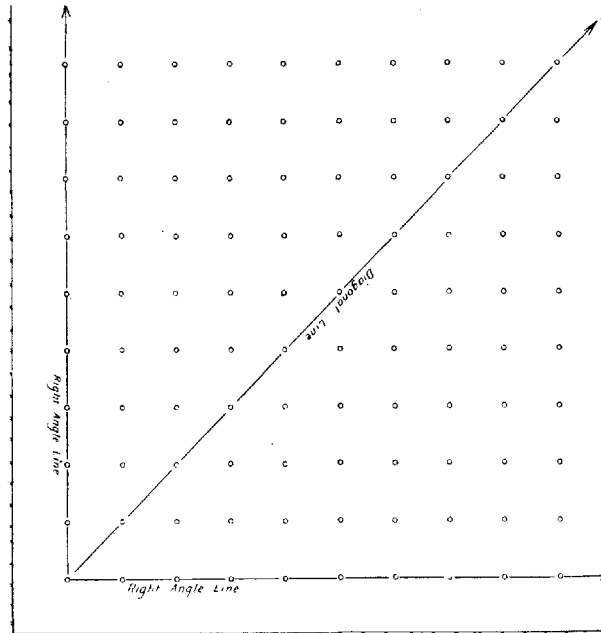


Plate 13.—Using the diagonal line as a check on the right angle.

ordinary way (*d c*) and (*b*) to (*a*), &c. When this is completed, two ordinary wires are drawn across each other, at right angles on the elevation and from corresponding pegs at each end of the wires. Where they cross each other marks the position of the pegs. Or the elevation may be pegged out as shown (*g, f, c*, Fig. 1).

#### POSITIONS OF TREES FOUND.

The rows of small circles in Plate 13 indicate the positions of 100 trees. The method of finding those positions is illustrated in Plates 9



and 10, and explained. Almost any number of acres in one orchard block may be worked in similarly.

It frequently happens that prospective fruit-growers, without previous knowledge of the work, and with limited capital, after selecting their land, usually clear and plant a few acres each year until the orchard area is completed.

When commencing to plant an orchard in this manner particularly, the north-east corner, preferably, should be made the base of operations, situation and general conditions permitting.

When an orchard has been started, on the lines laid down in these illustrations, it becomes a simple matter to continue the desired yearly extensions to the planted area.

This may be accomplished by using the planting wire to maintain straight right-angle lines in the direction to which the arrows point in Plate 13, using the diagonal line as a check on the right angles.

#### POSITIONS OF TREES FOUND BY SIGHTING.

Occasionally planters adopt the old method of "sighting" their trees into position. This is done by planting a tree in the right-angle corner in which operations are commenced. A peg is put in at the opposite end of the row, then a measuring rod is used to determine the distance between the first and second tree, a sight is taken from the first tree to the peg, and the second tree is planted in line, and so on until the row is planted. The remaining rows are worked in in like manner. But the planting cannot be so accurately done under the sighting process as it may be by using the planting wire.

It frequently happens that the rows which run at right angles to those sighted do not run in straight lines. Therefore, this method is more tedious, costly, and less accurate than the one advocated.

When all the essential details in connexion with laying out an orchard on sound commercial lines receive attention, at the proper time, the orchard becomes an object for prospective planters to emulate, a credit to the district in which it is situated, and a great attraction for intending purchasers, if the owner wishes to sell.

#### DIAGONAL PLANTING.

Although the square system of planting is recommended and mostly practised by our fruit-growers on account of its general suitability to the requirements essential to the thorough working of the orchard in relation to cultivation, drainage, irrigation, &c., certain local conditions occasionally occur in undulating districts, when the diagonal planting method has its advantages in respect to the requirements mentioned.

When orchards are planted on those hilly lands, irrigation from dams is the method invariably practised. When laying out the orchard, therefore, the lay of the land should be regarded as an important factor when determining the method of planting to be adopted.

The diagonal system consists mainly of running the rows of trees from corner to corner of the orchard or in diagonal lines from the headlands.

Plate 14 shows the diagonal system of planting and its suitability for cultivation and irrigation, &c., under certain circumstances.

To determine the positions for the pegs 20 feet is measured off for the headlands. Should the fence lines not describe a right angle, it may be found as previously described. When this is done the square may be completed, and the diagonal line found with the planting wire, and the row of pegs placed in position. The pegging out of the whole area may be completed by placing lines of pegs at right angles, or parallel to the diagonal line as depicted in the illustration.

In order to understand why the method of planting under review is advocated when local conditions require it, and for the reasons already explained, assume that a ridge runs in the direction of the

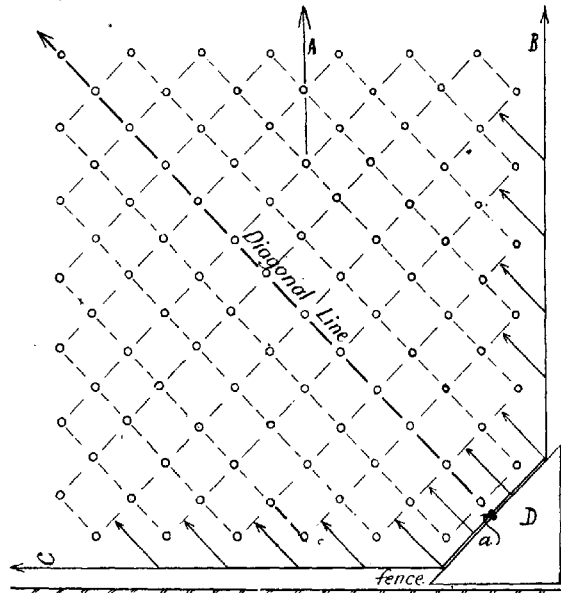


Plate 14.—Diagonal planting.

diagonal line, and that the land slopes abruptly from the ridge on both sides. It will be seen that the trees run in rows parallel to the ridge. This facilitates ploughing, spraying, &c., in that direction. And suppose the dam (D) to be on the highest point of the ridge. The water escapes at the vent (a) and is carried in the small drains (B) and (C) down the headlands. The small arrows denote the points at which the water may be diverted from the drains and directed amongst the rows of trees.

Now assume that the ridge runs in the direction to which the arrow (A) points and that the dam is on the highest point in line with it. Then it will be observed that, under these conditions, the square method

of planting would best suit the requirements, and for reasons similar to those advanced in favour of the diagonal method, when adopted advantageously.

Generally speaking, when establishing an orchard in a locality in which serious irregular undulations exist in the area to be planted, work to the contour, as nearly as circumstances will permit, by placing the rows of trees parallel to the ridges.

#### STAKES AND PEGS.

When the young trees are being planted out in their permanent positions in the orchard, particularly on exposed situations and when their roots are hard pruned, the use of stakes to support them is recommended. By this means they are enabled to maintain their upright positions until such time as the root systems are thoroughly estab-

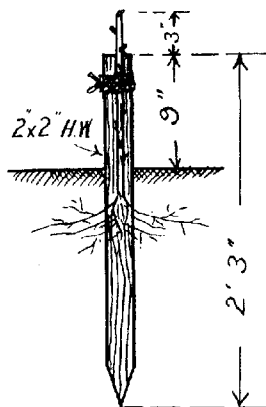


Fig. 1.

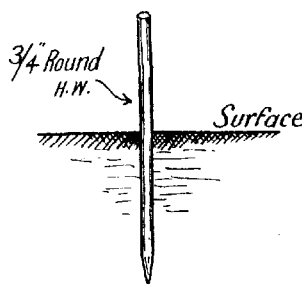


Fig. 2.

Plate 15.—Stakes and pegs for trees.

lished and thriftiness insured. When the stakes are not employed for the purpose mentioned, the wind causes the trees to wobble, and the young roots are frequently broken off on the side on which the wind strikes, causing the trees to lean to the opposite direction. It often proves a difficult proposition to remedy this defect.

When the stakes are used and the trees securely fastened to them, the root systems become established without interruption. This not only insures the trees' uprightness and future stability, but also permits of more extended root areas being operated upon to supply the sap requirements of the trees.

Trees with short stems, from 12 to 15 inches, are recommended, and particularly when the orchard is in an exposed situation. The tree should be planted to the same depth at which it grew in the nursery row.

Plate 15, Fig. 1, depicts stake, tree with three buds, from which the branch system is formed, projecting above top of stake, and method of tying. The relative positions of sixteen stakes of this kind are shown in Plate 11.

The stakes are made from 2-in. by 2-in. hardwood 2 ft. 3 in. long, and pointed as shown in the diagram, with 1 ft. 6 in. driven into the ground and 9 inches above the surface. Stakes 6 inches longer should be provided for use in loose sandy soils or on land where subsoiling operations have been carried out.

The trees should not be cut to the desired length prior to being planted, as the buds which are required to form the branch systems may be accidentally destroyed during planting operations. To secure the tree to the stake, procure a strip of hessian 2 feet long and 2 inches wide. Take one turn with the hessian first around the stake and then two turns around the tree and stake, then tie a piece of soft twine on the hessian to keep it in position as shown in the illustration.

If the tree is planted on the side of the stake facing south, the stem will be somewhat shaded from the sun and hot northerly winds, which frequently cause hardness of the bark, and often impede its development.

When stakes are not employed, pegs made from  $\frac{3}{4}$ -in. round hardwood about 1 ft. 6 in. long, as shown in Plate 15, Fig. 2, may be used to mark the positions of the trees. They are removed when the trees are being planted with the planting board.

*(To be continued.)*



ABRAHAM LINCOLN had a good notion of intensive cultivation. "More brain, less sweat," was his view on the matter. "How foolish," he remarked, "to walk over 40 acres when an equal crop can be raised from 10 acres by intensive cultivation."

As an instance of what irrigation can do, the example of Mildura may be cited. On an area of 12,000 acres, an inland community of 6,000 souls, enjoying a high standard of comfort, is maintained. The annual value of Mildura's products is no less than £450,000.

How the war affects America as regards potash salts—shipments to America, August, 1914, 50,000 tons; shipments, August, 1915, 500 tons. A big nitrate of soda concern during the past twelve months made a gross profit of only £8,000 against about £80,000 for the previous year.

WHEN taking cows to or from pasture, or, for the matter of that, anywhere, never hurry them, but allow them to walk at their own natural pace, and do not shout and holloa and kick up a row generally, as though you had a crowd of wild and savage beasts to deal with.

## HERD TESTING.

**Fourth Annual Report on the Testing of Pedigree Herds Conducted by the Department of Agriculture, Victoria, for year ended 30th June, 1916.**

*By W. A. N. Robertson, B.V.Sc., Chief Veterinary Officer, and  
R. T. Archer, Senior Dairy Inspector.*

Although there is a small reduction in the number of herds tested in the fourth year of operations, it may be claimed that the scheme is not decreasing in interest and value. Two new herds have entered the ranks, and many more are promised for the coming year, when the effects of the drought have passed away—the reduction in the total number is due to the inability of some of the breeders to obtain sufficient

**Blood will tell, No. 1.**

**Lady Viola, dam of Noble of Oaklands.**

fodder during the drought to even keep their herds in milk. In 1914-15 21 herds were tested; in 1915-16 only 16. Two herds dropped out by reason of dispersal sales, the balance by reason of drought and its consequent losses. It is anticipated that these latter will re-enter at an early date.

The object of the test must always be kept before the minds of breeders and dairymen generally. In no case must it be thought that extraordinary records are aimed at—rather are they discouraged for such are no indication of the merit of a herd. The main object is to work improvement in our stud stock, and by discovering strains of cattle which, when properly fed, will be a reliable source from which dairy-farmers may with confidence obtain sires as a means of increasing the average return from their cows. At the present time, with the reduced numbers in our herds, the opportunity for the dairy-farmer to build up

**Blood will tell, No. 2.**

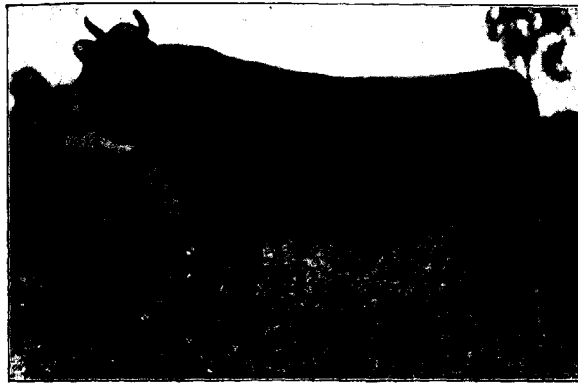
Noble of Oaklands, sire of Pretty Noble.

**Blood will tell, No. 3.**

Boutilliere, dam of Pretty Noble.

the average of his cows is enormous. Our average return is by no means small compared with other countries, but that they can be still further improved requires no comment. That breeding along right

**Blood will tell, No. 4.**



Pretty Noble.

**Blood will tell, No. 5.**



Lassie Fowler IV. of Melrose, by Pretty Noble.

lines will make an improvement is recognised by all. An example, however, of the effect of a sire with good records behind will not be out of place.

In an article in the *Journal* of this Department for July last, Mr. R. R. Kerr wrote—

The Jersey bull "Pretty Noble," imported from the Jersey Islands by Mr. W. Woodmason, has proved himself the sire of very fine heifers, and the yields of the first seven to complete the nine months' test are given, which, for consistency and general ability, would be very hard to beat. It is a matter of satisfaction to know that our breeders, generally speaking, now import only animals having records of butter production. Though they are desirous of securing animals true to type, they realize that production is the main essential.

Name of Heifer.*	Milk.	Test.	Fat.	Butter.	Milk Last Day.	Age at Calving.	Sire of Heifer.
	lbs.		lbs.	lbs.	lbs.		
Lassie Fowler IV. of Melrose (467)	5,977	5·69	340·32	388	15½	2 years 1 month	Pretty Noble (imp.)
Chevy VIII. of Melrose	6,011	5·63	338·56	387·75	19	2 years 3 months	Pretty Noble (imp.)
Empire V. of Melrose	5,661	5·42	307·08	350	15	2 years ..	Pretty Noble (imp.)
Jessie XII. of Melrose	5,063	5·99	303·25	345·5	18	1 year 11 months	Pretty Noble (imp.)
Edith II. of Melrose	5,418	5·48	296·69	338·25	14	2 years 6 months	Pretty Noble (imp.)
Pleasance V. of Melrose	4,859	5·1	277·57	316·5	13½	2 years 1 month	Pretty Noble (imp.)
Graceful Duchess XI. of Melrose	4,470	6·62	269·29	306·98	14½	1 year 8 months	Pretty Noble (imp.)
Average ..	5,351·2	5·69	304·68	347·3½	15·6	24·8 months	

\* The names are now given as accepted for Herd Book.

The dam of this bull, "Boutilliere," has had a wonderful record, her last obtained at 12 years of age being 12,103 lbs. milk, yielding 798½ lbs. of butter. She is a winner of many show ring prizes and butter contests—her photo. shows her to be a typical specimen. "Pretty Noble" is by "Noble of Oaklands," sold in America for £3,000, another specimen typical of the breed, and full of dairy qualities, inherited in turn from his dam, "Lady Viola," who had a wonderful record behind her both in the Show Ring and as a heavy testing cow.

That individual records are not the main object of the test is shown by the regulations under which the same is conducted. For instance, a lactation period of only nine months is taken instead of twelve months as followed in some countries, thus reducing the inducement to keep cows barren during the test, which would tend to increase the individual record. No breeder could afford to keep the whole herd out for the time required if this were done—nine months is taken as the fair period during which a cow milks, allowing her time to dry off and recuperate for the following season. To give an idea of her staying properties, the amount of milk given on the last day of the nine months is recorded, and a common basis is established upon which comparison may be made. In the same way butter fat production is taken. Nearly all countries of the world have now adopted this base, for no comparison can be made



when commercial butter is the term used to denote returns; in this regard it is to be regretted that the breeders of New South Wales have not adopted this most equitable method of computation.

It is somewhat early as yet to take returns of cows in Victoria to show the improvement of a herd by reason of testing, but the following example of the herd of Mr. August Kinch, in Sweden, is highly instructive:—

RESULT OF TEN YEARS' TESTING IN THE HERD OF MR. AUGUST KINCH,  
AT BELTABERGA, SWEDEN.

Testing Period— 365 Days.	Average Number of Cows in Herd.	Average Milk Per Cow, lbs.	Average Fat Test of Herd, per cent.	Average lbs. Butter Fat per Cow.	Cost to produce 100 lbs. Milk.
					s. d.
1899-1900 .. ..	70	7,320	3·05	223·26	3 7
1900-1901 .. ..	28	7,905	3·13	247·42	3 8
1901-2 .. ..	46	9,003	3·20	288·09	3 1
1902-3 .. ..	55	9,984	3·18	317·49	2 8½
1903-4 .. ..	61	10,584	3·22	340·80	2 7½
1904-5 .. ..	64	11,236	3·22	361·79	2 7½
1905-6 .. ..	71	11,333	3·21	363·78	2 10½
1906-7 .. ..	79	11,486	3·18	365·25	2 11
1907-8 .. ..	77	11,023	3·17	349·42	3 0
1908-9 .. ..	79	11,399	3·34	380·62	2 10½
		+4,079	+0·29	+157·36	-0 10½

Increase (+); Decrease (-).

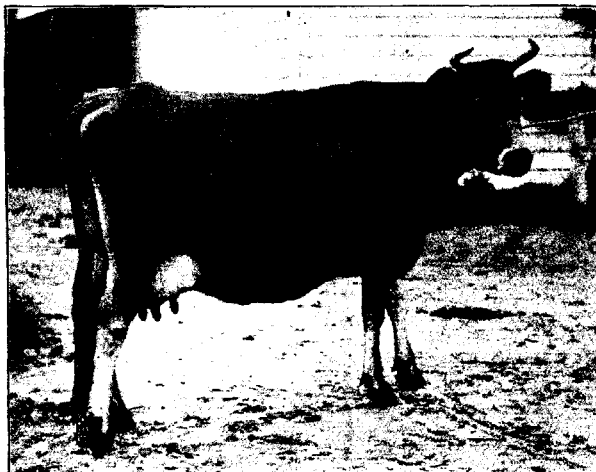
The original herd of 70 was reduced to 28. The others were proved unprofitable and sold. The heifers of the 28 were reared and added to the herd. In ten years the herd average had increased by 400 gallons of milk and 157 lbs. of butter fat, which, at 1s., represents an increase of £7 17s. per cow.

What results may be obtained from a number of herds is shown in the following table covering a period of ten years:—

RECORD OF A SWEDISH COW-TESTING ASSOCIATION FOR TEN YEARS.

	Average Milk Yield per Cow.	Average Fat Test.	Average lbs. Butter Fat per Cow.
1st year .. ..	6,890	3·11	214·27
2nd " .. ..	6,582	3·11	204·70
3rd " .. ..	7,357	3·16	232·48
4th " .. ..	7,602	3·17	243·83
5th " .. ..	7,653	3·04	232·65
6th " .. ..	8,269	3·04	251·37
7th " .. ..	9,165	3·05	279·22
8th " .. ..	9,338	3·15	294·14
9th " .. ..	9,183	3·15	289·26
10th " .. ..	10,064	3·12	313·89
Increase .. ..	3,174	..	109·62

The result of ten years' operations was to increase the average milk yield by 317 gallons, and butter fat 109 lbs., while the butter-fat test remained about the same. This is low compared with the average test in the herds in this country, and would indicate that we would have nothing to gain by the introduction of their breeds of cattle. If their methods of management and feeding were more largely adopted here our results would compare very favorably with those of other countries.



Jessie VI. of Melrose (on completion of test), 1st in Order of Merit, 1916  
(250 lbs. standard).

Winner Annual Champion Prize.				Owner, Mr. W. Woodmason.		
—	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Milk.
1915	7,924½	6·71	532·17	250	21½	273
1916	8,342	6·27	523·34	250	13½	273

In Denmark the improvement of milk yield due to system of records adopted is shown by the following figures:—

1844—average yield per cow	..	..	1,650 lbs.
1864—average yield per cow	..	..	2,500 lbs.
1884—average yield per cow	..	..	3,300 lbs.
1894—average yield per cow	..	..	4,850 lbs.
1911—average yield per cow	..	..	6,150 lbs.

In 1908, as against 1884, the average yield of butter had exactly doubled, and was 224 lbs.

#### SCOTTISH RECORD.

Professor Alexander Laurie, D.Sc., writes in regard to testing in Scotland—

In Scotland the work is carried on through local societies, consisting of 20 to 24 members, so that the work of each society is sufficient to take up the whole time of a recorder. The weighing and testing may be

done every 14, 21, or 28 days, an interval of 21 days being most common. The recorder arrives at the farm in the afternoon, weighs, and determines the percentage of fat in the evening milk and the morning's milk next day. All the testing and weighing is done by the recorder, the farmer being only asked to supply details as to feeding, times of calving, &c. A copy of the record is left with the farmer, and a copy forwarded to the Central Committee.



Lady Grey V., 2nd in Order of Merit 1916 (250 lbs. standard).

Winner Annual Reserve Champion Prize. Owner, Mr. A. W. Jones.

—	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Milk.
1914 ..	5,437½	5·62	305·87	175	12	259
1915 ..	8,329½	5·61	466·93	200	20	273
1916 ..	9,615	5·11	491·59	250	33	273

In six or eight years the average annual milk yield has been increased by 100 to 200 gallons per cow. The increase in the value since the beginning of the scheme, of pedigree (milk record) Ayrshires for export purposes is estimated at about 50 per cent.

There have not been sufficient sales conducted in Victoria as yet from which to learn to what extent testing adds to the value of a cow, but in the University of Illinois, where certain information has been accumulated, it was found in respect of five different sales that—

187 cows without records averaged ..	£57 10 0
171 cows with records averaged ..	93 0 0
showing increased value due to record ..	£35 10 0

Amongst heifers—

184 heifers from dams without record averaged	£42 0 0
133 heifers from dams with record averaged	£68 10 0
showing a value of £26 10s. for the dam's record before the progeny came into profit.	

Before entering upon the records in Victoria during the past year, let us look at some of those obtained in other countries.

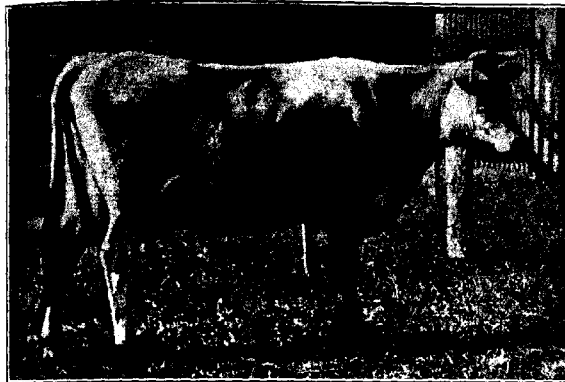
**Tasmania.**

In Tasmania, the testing period covers only six months, and part of a herd only may be tested. Whilst the information thus gained is valuable, it encourages individual records by allowing only the best of the herd to enter and forcing for six months. The standard required is 200 lbs. butter fat and 4,000 lbs. milk. At a recent conference of dairymen it was reported that there were 17 Ayrshires in the register, as under:—

—	Lbs. Fat.	Lbs. Milk.	Average Test.
Jewel Queen of Gowrie Park .. ..	297·12	7,785	4·1
Princess .. ..	282·81	5,580	5·0
Hawthorn .. ..	273·11	6,090	4·4
Shamrock .. ..	261·10	5,640	4·6
Bonnie Jean .. ..	256·65	5,970	4·3
Lilac .. ..	253·52	6,150	4·1
Lessnessock's Favourite .. ..	249·03	6,450	3·7
Soncey .. ..	246·24	4,950	4·9
Fancy .. ..	234·81	5,250	4·5
Bonnie, Favourite of Gowrie Park ..	228·88	6,165	3·7
Lily .. ..	223·83	5,880	3·8
Dairymaid .. ..	223·14	4,590	4·8
Fan .. ..	212·64	5,010	4·2
Royal Dewdrop .. ..	209·19	4,755	4·4
Ruby .. ..	209·03	4,590	4·4
Belle .. ..	203·64	4,290	4·7
Maggie .. ..	202·26	5,310	3·8

There were ten Jerseys entered in the advanced registry of the *Tasmanian Jersey Herd Book*. The average production of these cows was, for the six months, 244 lbs. fat and 4,815 lbs. milk; average test, 5 per cent. The following are the cows in order of their production of butter fat:—

—	Lbs. Fat.	Lbs. Milk.	Average Test.
Roi .. ..	289·14	4,965	5·8
Sylvan .. ..	279·66	5,850	4·8
Meg, 1915 .. ..	271·23	6,030	4·5
Niwa .. ..	266·07	5,100	5·3
Daphne .. ..	244·41	4,360	5·5
Violet .. ..	241·98	4,740	5·1
Ruby .. ..	239·46	4,620	5·1
Gay .. ..	232·41	4,275	5·4
Meg, 1914 .. ..	214·77	4,385	4·9
Lil .. ..	202·65	4,140	4·9
Topsy .. ..	202·47	4,500	4·6



Parrakeet, 1st in Order of Merit 1916 (200 lbs. standard).

Owner, Mr. C. Gordon Lyon.

—	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Milk.
1915	7,287	4.70	342.65	175	18	273
1916	9,827	4.47	438.90	200	20	273



Lady Grey 1st of St. Albans, 1st in Order of Merit 1916 (175 lbs. standard).

Owner, Mr. A. W. Jones.

—	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Milk.
1916	5,255	6.61	347.36	175	17½	273

**New Zealand.**

The New Zealand Jersey Cattle Breeders' Association's annual report for 1915-16 shows that during the past year 97 cows have been awarded certificates by the New Zealand Department of Agriculture as the result of the semi-official test conducted by that Department. The average production of these 97 cows was as follows:—

	Days in Milk.	Average lbs. of Milk.	Average Test.	Average lbs. Butter Fat.	Average lbs. Milk per Day.	Average lbs. of Butter Fat per Day.
42 Two-year olds ..	344	6,538·6	5·611	366·94	19·0	1·07
22 Three-year olds ..	354	7,686·47	5·812	446·81	21·71	1·262
14 Four-year olds ..	335	8,459·11	5·410	457·58	25·22	1·365
19 Mature ..	348	7,796·44	5·511	484·84	25·27	1·393
97 Cows (average) ..	345	7,518·75	5·604	421·35	21·79	1·224

"Madam Mayflower," semi-official record of 11,793.2 lbs. of milk and 763.41 lbs. of butter-fat in 365 days, is claimed as a Jersey record for the Southern Hemisphere.

It may be noted that the above records cover a period averaging 345 days.

**Canada.**

The average milk production of cows in Canada, according to official files, is 3,800 lbs., and of butter fat 150 lbs. per annum.

In 1913 the number of cows tested in the Canadian herd test was 4,852, giving an average return for the full lactation period of 5,856 lbs. milk, with an average test of 3.4, and butter fat 201 lbs. The best records obtained are shown hereunder:—

Breed.	Name of Cow.	Age.	Lbs. of Milk.	Per cent. Fat.	Lbs. Fat.
Holstein ..	Duchess Skylark Ormsby	Mature	27,761	4·3	1,205·09
" ..	Tilly Alcarta ..	"	30,452	3·1	951·30
Jersey ..	Sophy 19th of Hood Farm	"	17,557	5·6	999·2
Guernsey ..	Murne Cowan ..	"	24,008	4·5	1,098·1
Ayrshire ..	Auchenbrain Brown Kate	"	23,022	3·9	917·60
French-Canadian	4th Pille ..	"	10,767	4·2	453

The highest records for Shorthorns are 13,535 lbs. milk, 540 lbs. fat. and 11,578 lbs. milk, 534 lbs. fat.



Lassie Fowler III. of Melrose. Owner, Mr. W. Woodmason.

—	Lbs. of Milk	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Test.
1915	7,287½	5.83	425.0	250	22	273
1916	8,121	5.48	446.29	250	23	273



Sweetbread 24th (imp.). Owner, Mr. C. D. Lloyd.

—	Lbs. of Milk	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Test.
1914	8,421	5.84	482.19	250	24	273
1915	8,504	5.87	482.28	250	17	273
1916	8,484	5.33	462.42	250	16	273

**United States of America.**

The conditions under which some of the testing is done in United States of America will be of interest. The following are the Rules and Regulations of the Advanced Register of the Holstein Friesian Society:—

All tests are conducted by representatives of the State Agricultural Colleges, i.e., supervisors. Fees are fixed by the State colleges for conducting the test. Some charge £5 for a seven days' test, with 12s. 6d. a day for extra time. New York charges 10s. a day for time actually occupied in test with 4s. 2d. extra for each cow that qualifies.

In a seven days' test the supervisor must see the cow milked dry on the last milking prior to commencement of test, and carefully note the hour, so that the last milking of the test shall be done at exactly the same hour. Only one cow may be milked at a time, so that the milk can be kept under close scrutiny. It is recommended that a supervisor shall have only six cows at one time. Samples are taken by pouring the milk from one pail to another or by a dipper.



**Mythic. Owner, Mr. C. G. Knight.**

—	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Test.
1915	6,031	5.25	316.58	250	44	253
1916	7,096½	5.09	361.27	250	14½	273

Tests are made in duplicate, and the fat is shown in three decimals. If the fourth figure is 5 or greater, it is counted 1, if less than 5 it is dropped.

Tests are made by the supervisors on the farm and composite sample is taken, i.e., with a pipette the same number of cubic centimetres as lbs. of milk into a jar from each milking, with a preservative. This is tested at the college as a check on the individual test. Subject to all conditions imposed by the rules of this association, State Agricultural Colleges may supervise the tests made by cows in their own herds; but no test made by any cow owned by such institution, that is made under the supervision of its own officers, shall be eligible to compete for any prize that may be offered by this association.



An official test may cover any number of consecutive days.

No official test shall be accepted that is begun earlier in the lactation period than the morning of the seventh day after calving.

Semi-official yearly test or lactation test is taken, on two consecutive days each month, beginning not earlier than fourth day after calving, continuing during the lactation period or such consecutive part of it, as the owner may desire, but not exceeding 365 days in length. Not less than three different supervisors shall be employed in a semi-official test, and no supervisor should conduct the test in two successive months. Only official tests are accepted for Advanced Register, but semi-official records are credited when the cow has been accepted for Advanced Register.

In Illinois, the highest records of the different breeds are as follows:—

Name.	Milk.	Test.	Fat.
	lbs.		lbs.
Jersey—Jacoba Irene .. .. .	17,253	5.51	952.0
Holstein Friesian—Pietertje Lass Aggie Netherland 2nd .. .. .	20,165.4	3.27	660.70
Guernsey—Dolly Bloom of Langwatter .. .. .	12,024.5	5.25	632.34
Brown Swiss—Belle Windsor .. .. .	10,959.8	4.15	455.08

These records are for 365 days.

They claim Jacoba Irene's as the highest record ever made by a Jersey cow. The following are her records for four years:—

—	Milk.	Fat.
	lbs.	lbs.
Year ending in 1906 .. .. .	11,391	619
" " 1907 .. .. .	14,255	792
" " 1908 .. .. .	17,253	952
" " 1910 .. .. .	12,001	667.8

It will be noticed that she missed 1909. The inference is she was not in calf when she made her best record.

Amongst Ayrshires in the Advanced Register it is seen that the average return is as under for a year's test:—

—	Milk.	Test.	Fat.
	lbs.		lbs.
Average for 2 year old .. .. .	8,719	40.5	353.06
" " 3 " .. .. .	10,079	3.78	381.26
" " 4 " .. .. .	10,560	4.02	424.10
" " mature .. .. .	10,977	3.83	420.62
Average for whole .. .. .	9,888	3.95	390.22



Princess of Springhurst. Owner, Mr. J. D. Read.

—	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Milk.
1914	.. 6,228½ ..	6*14 ..	382*33 ..	250 ..	18½ ..	273
1915	.. 6,291 ..	5*87 ..	369*11 ..	250 ..	7½ ..	273
1916	.. 5,869 ..	6*05 ..	355*28 ..	250 ..	8½ ..	273



Arcardia. Owner, Mr. C. G. Knight.

—	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Milk.
1915	.. 4,842½ ..	5*49 ..	265*9 ..	250 ..	9 ..	273
1916	.. 6,955½ ..	5*31 ..	369*55 ..	250 ..	16½ ..	273

Victoria may well be proud, therefore, of some of the records already established for this breed amongst the Gowrie Park herd in 273 days' record.

	Milk.	Test.	Fat.
	lbs.		lbs.
Moonlight .. .. .	10,079	4·95	499
Linda .. .. .	13,401	4·78	640½
Laura IV. .. .. .	10,764	5·28	509
Ida .. .. .	11,917	5·08	605
Honey .. .. .	12,655	4·41	558
Blossom .. .. .	10,601	4·94	524
Scottish Queen .. .. .	12,022	4·87	585
Pretty .. .. .	11,196	4·42	495

#### New South Wales.

In the June issue of the *Agricultural Gazette* of New South Wales appears the records of 57 cows, who have completed their nine months' test; those giving a yield of more than 380 lbs. of butter are reproduced:—

Name.	Yield, Nine Months.		Yield, last Day.	
	Milk.	Butter.	Milk.	Butter.
	lbs.	lbs.	lbs.	lbs.
Pretty May .. .. .	7,360	471	18·5	1·18
Bertha of Eumaralla .. .. .	6,784	459	20	1·29
Susie VI. .. .. .	6,823	459	17·6	1·34
Daisy VI. .. .. .	7,254	454	28	1·95
Silvery .. .. .	6,737	451	16	1·07
Daisy IV. .. .. .	6,604	447	12	1·01
Kenta's Twilish .. .. .	6,504	421	12·5	0·84
Silver Bet .. .. .	6,486	410	14	1·08
Daisy VII. .. .. .	7,413	404	17	1·03
May Pinora .. .. .	6,276	400	14	1·01
Princess XIV. .. .. .	6,582	390	13·5	0·98
Pearl .. .. .	6,076	389	15·5	1·04
Goulisse 15th! .. .. .	5,727	383	16	1·17

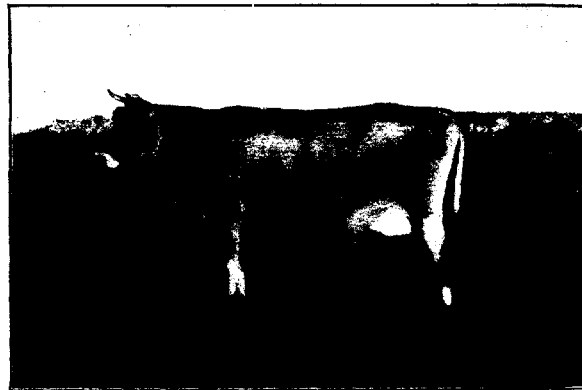
#### Victoria.

Let us now look at the records that have been obtained during the past year in Victorian herds. Bearing in mind that a portion of the drought period is included, and in all cases, owing to the same cause, the cows were heavily handicapped on entry, they cannot be regarded as other than highly satisfactory, and amongst so many good returns no more than passing notice can be given. The Jerseys are again well to the fore both in the numbers entered and in the returns obtained.

Pride of place is obtained by Mr. W. Woodmason, with "Jessie VI. of Melrose," who gave 8,342 lbs. of milk, and an average test of 6.27, equal

to 523.34 lbs. of butter fat. This cow in the previous year was sixth in order of merit amongst all breeds, but first amongst the Jerseys, giving a slightly higher yield of butter fat on that occasion, 532 lbs. from a smaller yield of milk, viz., 7,924 lbs. A full sister "Jessie IX." comes nineteenth in order of merit, with 418 lbs. butter fat, showing that the strain is good. In gaining this position, and provided she calves again within fifteen months of last calving, Mr. Woodmason wins the Annual Champion Prize offered by the Department for the cow giving the greatest yield of butter fat during the year.

Second in order of merit and winner of the Annual Reserve Champion Prize comes Mr. A. W. Jones, with "Lady Grey V.," having a record of 9,615 lbs. of milk and 491.5 lbs. of butter fat. This cow has been a persistent performer, giving 305 lbs. butter fat as a heifer when she was



**Dainty 6th. Owner, Mr. Trevor Harvey.**

—	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Milk.
1916	5,306	5.66	300.33	175	19½	273

sixth in her class, 466.9 lbs. on her second calf when she was third in her class, and now moves up to second place in the 250-lb. class. Her full sister, "Lady Grey I.," as is shown later, is first in the heifer class. "Birdseye," one of the red polls on the Werribee Research Farm, is third. This cow was sixth in the 200-lb. class in 1914, with 341 lbs. of fat, 22nd in 1915 in the 250-lb. class, and now third with 485.9 lbs. of butter fat.

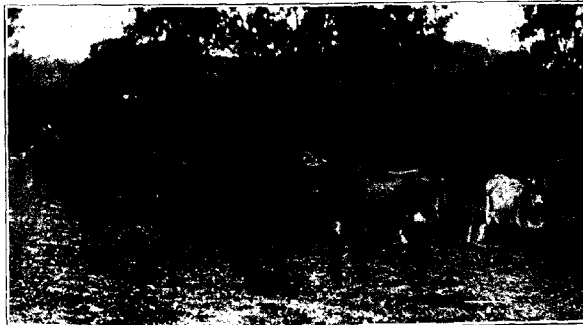
Two cows that call for more than passing notice are Mr. C. G. Lyon's 16-year-old cow "Noreen," who, with a return of 473 lbs. of fat, gained sixth place in the list; she was fifteenth last year, and third the year before, showing remarkable returns; and Mr. W. Woodmason's "Jessie's Progress," which, with a return of 464 lbs. of butter fat, is seventh in order of merit at the good old age of nineteen years. Only one daughter and one granddaughter of this old cow are in the test in

"Jessie XI.", the daughter, which is twelfth on the list with a return of 430 lbs. of butter fat, and "Wilful Venture," the granddaughter, exempted this year on account of sunstroke, but thirteenth last year with 480 lbs. of fat.



**Brownbread. Owner, Mr. C. D. Lloyd.**

	Lbs. of Milk.	Test.	Butter Fat (lbs.)	Standard (lbs.)	Milk Last Day (lbs.)	Days in Milk.
1916	3,936½	6.32	248.70	175	8	273



**Tulip, Princess, Grannie, Nightshade.**

**Owner, Mr. J. D. Read.**

"Sweetbread XXIV." owned by Mr. C. D. Lloyd, is again well to the fore, being ninth with 452 lbs. of butter fat, and one of her heifers, "Creambread," comes fifth in the heifer class with 310 lbs.

Ayrshires are not well represented in this year's operations, only two herds being entered, and both of these suffered severely by reason of the drought.

Amongst the cows under 4 years of age—200-lbs. standard—Mr. C. G. Lyon takes first place with "Parakeet," which yielded 438.9 lbs. of butter fat, passing from sixth in the heifer standard last year.

Mr. Woodmason's "Mystery XIII. of Melrose" comes second, and maintains a high average test of 6.46, being the fifth highest for the year, while a half-sister, "Mystery IX," comes seventeenth in order of merit, and best of this line in the open class. Mr. A. W. Jones, with "Lady Grey VIII.," is third.

In the heifer class Mr. A. W. Jones scores with "Lady Grey I. of St. Albans," with a return of 347 lbs. of fat, Mr. Woodmason taking the three next positions with "Chevy VIII. of Melrose.," "Jessie XIII.," and "Handsome Girl VII."

The highest average test obtained during the year is 6.71. This was obtained by Mr. C. D. Lloyd's "Queen Spark."

#### HERD PRIZE.

Six herds are eligible to compete for the herd prize donated by the Government, which is offered to herds in which ten or more cows complete their period within the twelve months ended 30th June. This prize is allotted on a handicap basis. In the first place, heifers who have to attain the 175-lb. standard receive a handicap of 75 lbs. of butter fat each.

Those which have to reach 200-lbs. standard receive 50 lbs. each, and every cow in the herd, when the total is above ten, receives  $\frac{1}{2}$  lb. of butter fat for each cow. The average for each cow must be 300 lbs. of fat; thus a herd of ten cows, giving an average of 300 lbs. of fat, would be beaten by a herd of 30 cows whose average was 286 lbs. of fat. The 30 cows would each receive 15 lbs. handicap, bringing the total to 301 lbs. average, exclusive of handicaps for heifers and second calf cows.

Only four of the herds, eligible by number of cows, are qualified by herd average for the prize, as shown below.

Mr. W. Woodmason's "Melrose" herd takes pride of place with the average return of 403 lbs. of butter fat per cow, including handicap allowances in a herd of 51 cows.

Mr. C. G. Lyon's "Banyule" herd is second with 384 lbs. of fat, as an average with fourteen cows.

The figures cannot be regarded as other than highly satisfactory.

A pleasing feature of the result is seen in comparing the average of these herds without the herd allowance, when Mr. Woodmason's herd shows an average almost identical with that of Mr. Lyon's.

Seeing the difference in the number of cows, the inference is that the tail end of the herd is a good one.



Mollie II.

Owner, Mr. C. Gordon Lyon.

Silvermine III.

Silvermine IV.

**PRIZE LIST.**

The following are the prizes offered by the Government for the year ended 30th June, 1916. The prizes will be awarded through the Royal Agricultural Society:—

- (1) *Grand Champion Cow*—under Herd Test regulations.

A grand champion prize of £100 as a trophy or cash for maintaining the position of annual champion for three successive years. *Not yet allotted.*

- (2) *Annual Champion Cow*—under Herd Test regulations.

A prize of £25, to be awarded to the cow which, on completion of lactation period, gives the greatest amount of butter fat under the herd testing regulations of this Department during a lactation period terminating within a year ending 30th June. If two lactation periods are completed within the year, the last will be the period considered.

*Won by "Jessie VI. of Melrose"; owner, Mr. W. Woodmason.*

- (3) *Annual Reserve Champion*—under Herd Test regulations.

A prize of £15 per annum to be awarded to the cow attaining second place under the herd testing regulations of the Department during year ended 30th June.

These prizes to be awarded conditionally upon the winning cow being exhibited at the next Royal Agricultural Show. In the event of the death of the winning cow prior to such show, the owner to exhibit his next best cow.

*Won by "Lady Grey V."; owner, Mr. A. W. Jones.*

- (4) *Best Herd*—under Herd Testing regulations.

A prize of £50, to be awarded to the herd giving the greatest average return under the herd testing regulations of this Department under the following conditions:—

- (1) Minimum number of cows (completing the test during the year) in a herd—10.

- (2) Such herd to average 300 lbs. of butter fat.

- (a) Handicaps to be allowed under the following scale:—

I. A herd of more than 10 cows will receive a handicap of  $\frac{1}{2}$  lb. of butter fat for each cow.

II. Cows entered under Regulation 11 (a) will receive a handicap of 75 lbs. of butter fat.

III. Cows entered under Regulation 11 (b) and (c) to receive a handicap of 50 lbs. of butter fat.

The prize to be allotted for the year ending 30th June, and the three best cows in the winning herd to be exhibited at the next Royal Agricultural Society's Show.

*Won by Melrose Herd; owner, Mr. W. Woodmason.*

No cow competing for any prize shall be milked more than twice a day, and must calve again within 15 months.



## RETURN OF CERTIFICATED COWS FOR YEAR ENDING 30th JUNE, 1916.

MRS. A. BLACK, Noorat. (JERSEY).

Completed during the year—12. Certificated—2.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Madge	3575	27.5.15	3.6.15	273	12	4,624½	5.04	233.04	1bs.	265½
Dolly of Clydebank II.	3742	9.8.15	16.8.15	248	4	3,596	6.32	227.46	200	259½

A. BOX, Hiawatha. (JERSEY).

Completed during the year—8. Certificated—8.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Roseneath Sylvia	3776	9.11.14	16.11.14	273	8½	4,305	5.30	232.29	200	264½
Roseneath Twylsh	Not yet allotted	17.12.14	24.12.14	273	12½	3,884	5.21	202.58	175	231
Roseneath Fox's Twylsh	3775	19.12.14	26.12.14	273	13	4,959	5.35	265.43	250	302½
Lass' Favourite	Not yet allotted	3.5.15	10.5.15	273	14	4,881½	4.42	215.82	175	246
Larkspur's, Claribelle VI.	3772	16.9.15	23.9.15	273	19	7,533½	4.72	355.52	250	405½
Roseneath Daphne	3774	16.9.15	23.9.15	273	9½	4,968	5.18	272.38	250	310½
May's Gem	Not yet allotted	19.9.15	26.9.15	273	12	4,176½	4.91	205.29	175	234
Roseneath Favourite IV.	Not yet allotted	23.9.15	30.9.15	273	10½	5,821	4.45	259.33	200	295½

F. CURNICK, Malvern. (JERSEY).

Completed during the year—2. Certificated—2.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Iris	3770	19.10.14	26.10.14	273	15½	6,216½	4.78	297.26	200	338½
Dearest Pearl	3771	2.2.15	9.2.15	273	17½	6,017	5.27	317.23	200	361½

## DEPARTMENT OF AGRICULTURE, Warricoo. (RED POLL.)

Completed during the year—46. Certificated—40.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
					lbs.	lbs.		lbs.	lbs.	lbs.
Britannia ..	Not yet allotted	6.10.14	13.10.14	273	16	6,889½	3.92	268.81	200	306½
Soudana ..	"	20.11.14	27.11.14	273	15½	4,707	4.40	207.17	175	266½
Laurel ..	"	8.12.14	15.12.14	273	13½	5,006½	4.02	201.41	175	229½
Ontario ..	"	18.12.14	25.12.14	273	16	4,739	4.21	199.68	175	227½
Japan ..	"	24.12.14	31.12.14	273	19½	6,568	3.50	229.74	200	262
Caribba ..	"	3.1.15	10.1.15	273	18	5,518	4.29	236.92	200	270
Ardath ..	"	15.1.15	22.1.15	273	13	6,189½	4.78	200.05	250	337½
India ..	"	8.3.15	15.3.15	273	26½	8,146	4.11	335.23	250	382½
Connecticut ..	"	3.4.15	10.4.15	273	21	7,204½	4.75	342.36	250	390½
Panama ..	"	12.4.15	19.4.15	273	17	5,869	4.23	248.45	200	283
Vuelta ..	"	25.4.15	2.5.15	273	20	8,314	4.03	334.89	250	381
Phillipina ..	"	26.4.15	3.5.15	273	19	7,124	4.82	343.13	250	391
Primrose League (imp.) ..	"	10.5.15	17.5.15	273	19½	6,831	4.34	296.27	250	352½
Alpina ..	"	13.5.15	20.5.15	273	15½	6,357	4.00	254.23	250	329½
Turka ..	"	18.5.15	23.5.15	273	32½	6,362	4.06	315.92	250	390½
Sumo ..	"	23.5.15	30.5.15	273	15½	5,873	4.72	277.32	250	316½
Sumatra ..	"	24.5.15	31.5.15	273	20	7,494	4.40	329.71	250	353½
Tennessee ..	"	26.5.15	2.6.15	273	14½	5,075	4.09	297.77	200	286½
Mexicana ..	"	1.6.15	8.6.15	273	16	7,969	4.30	349.54	250	398½
Asiana ..	"	5.6.15	12.6.15	273	12½	6,387	4.63	295.00	250	336½
Samorna ..	"	12.6.15	19.6.15	273	10½	5,409½	4.71	254.68	200	290½
Netherland ..	"	22.6.15	29.6.15	273	28	9,455½	4.25	402.03	250	458½
Serbia ..	"	30.5.15	6.7.15	247	28½	4,271	4.22	173.79	175	295
Sylvia ..	"	4.7.15	11.7.15	273	13½	4,899	4.78	231.43	200	267½
Pipio ..	"	2.8.15	9.8.15	273	13	5,906½	5.04	297.49	200	339½
Itala ..	"	3.10.15	10.8.15	273	16½	4,695	4.14	194.30	175	221½
La Reina ..	"	12.8.15	19.8.15	273	17	6,004½	4.96	297.65	200	339½
Cuba ..	"	17.8.15	24.8.15	273	19½	7,924	4.55	360.82	250	411½
Kentucky ..	"	22.8.15	29.8.15	273	18	9,632	3.88	350.67	250	399½
Russia ..	"	25.7.16	1.8.15	273	28	4,943	3.62	188.69	175	215
Persia ..	"	26.8.15	2.9.15	273	18½	6,797½	4.03	335.29	250	382½
Pennsylvania ..	"	27.8.15	3.9.15	273	7	8,203	4.00	327.96	250	373½
Piotee ..	"	30.8.15	6.9.15	273	13½	7,317	4.84	317.76	250	362½
Lily ..	"	1.9.15	8.9.15	273	18½	7,077½	4.55	322.35	200	307½
Birdseye ..	"	7.9.15	14.9.15	273	18	6,873	6.42	435.95	250	554
Bullion ..	"	12.9.15	19.9.15	273	11½	7,121	4.38	311.79	250	355½
Violet III. ..	"	13.9.15	20.9.15	273	14½	7,940½	4.49	356.85	200	406½
Pacific ..	"	17.9.15	24.9.15	273	13	3,868½	4.76	194.02	175	209½
Mongolia ..	"	17.9.15	24.9.15	273	10	7,415	4.30	319.81	300	394½
Goldenf ..	"	20.8.15	27.9.15	245	4	6,665	4.43	295.62	250	337

\* Lost first 26 days through weights not being available.

## GEELONG HARBOUR TRUST, Marshalltown. (AYRSHIRE.)

Completed during the year—16. Certificated—6.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
					lbs.	lbs.		lbs.	lbs.	lbs.
Gipsy Maid II. of Sparrowale ..	2511	25.11.14	2.12.14	273	13½	4,916	4.40	216.12	175	246½
Winnie of Glen Elgin ..	1850	25.2.15	4.3.15	273	12½	6,265½	4.18	262.20	250	299
Gipsy Maid of Glen Elgin ..	1818	2.4.15	9.4.15	273	8½	6,180	4.27	264.09	250	301
Ruby of Glen Elgin ..	1836	6.5.15	13.5.15	273	19	8,538	4.13	352.98	250	402½
Ruby of Sparrowale ..	2512	18.6.15	25.6.15	273	7½	7,178	4.37	313.42	200	367½
Princess Edith of Gowrie Park ..	2876	1.9.15	8.9.15	273	7½	5,488½	4.19	229.85	200	262

**TREVOR HARVEY, Boisdale. (JERSEY.)**

Completed during the year—4. Certificated—4.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Expiry to Test.	No. of Days In Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Dainty VI. . .	Not yet allotted	10.1.15	17.1.15	273	lbs. 19½	5,306	5.66	lbs. 300.33	lbs. 175	lbs. 342½
Lady Marge IV. . .	2673	12.4.15	19.4.15	273	12½	4,718½	5.43	256.21	175	292
Spartan . . .	2975	29.4.15	6.5.15	273	15	5,001	8.27	324.45	200	329½
Ruchell of Pine Hills . .	2975	13.8.15	20.8.15	273	14	5,079	5.82	295.86	200	337½

**A. W. JONES, Whittington. (JERSEY.)**

Completed during the year—4. Certificated—4.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Expiry to Test.	No. of Days In Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Dolly	3754	10.12.14	17.12.14	273	lbs. 18	4,936½	6.24	lbs. 308.23	200	lbs. 351½
Lady Grey 'I. of St. Albans . . .	Not yet allotted	9.3.15	16.3.15	273	17½	5,255	6.61	347.36	175	398
Lady Grey VIII. . .	3756	28.3.15	4.4.15	273	17½	7,126½	5.35	381.76	200	435½
Lady Grey V.* . .	3756	8.7.15	15.7.15	273	33	9,615	5.11	491.59	250	560½

\* Owing to an error in the calving and expiry dates this cow was not credited with full yield in the quarterly report.

**G. G. KNIGHT, Cobram. (JERSEY.)**

Completed during the year—18. Certificated—16.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Expiry to Test.	No. of Days In Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Arcadia . . .	1534	28.9.14	4.10.14	273	lbs. 9	4,842½	5.49	lbs. 265.90	200	lbs. 303
Bridesmaid of Tarnpurr . .	2981	2.10.14	9.10.14	273	11	4,676	4.85	226.03	175	258½
Princess of Tarnpurr . .	2986	8.10.14	15.10.14	273	8	4,835	5.09	246.28	200	290½
Melrose of Tarnpurr . .	2984	23.1.15	30.1.15	273	17	5,282	5.29	279.12	200	313½
Romany Lass . . .	2503	18.5.15	25.5.15	273	11½	5,032½	6.63	335.50	200	328½
Any Castles . . .	1520	31.5.15	7.6.15	273	11	5,542	5.29	293.16	250	334½
Allice of Tarnpurr . .	Not yet allotted	14.7.15	21.7.15	273	7	3,870	5.80	224.60	175	256
Sweetheart of Tarnpurr . .	2987	19.7.15	25.7.15	273	10½	5,056	4.55	231.08	200	283½
Lily of Tarnpurr . . .	2221	24.7.15	31.7.15	273	11	6,293	4.53	285.03	250	325
Idyll's Ideal . . .	2096	30.7.15	6.8.15	273	11½	5,426½	4.96	269.49	250	307½
Mythie . . .	2404	6.8.15	13.8.15	273	14½	7,096½	5.09	361.27	250	411½
Foxglove of Tarnpurr . .	2983	13.8.15	20.8.15	273	10½	4,512½	5.89	265.96	200	303½
Arcadia . . .	1534	17.8.15	24.8.15	273	10½	6,959½	5.31	306.55	250	421½
Princess of Tarnpurr . .	2985	27.8.15	3.9.15	273	10½	4,865	5.31	270.90	200	309½
Bridesmaid of Tarnpurr . .	2981	7.9.15	14.9.15	273	10½	4,865	4.58	212.24	200	242
Bonnie of Tarnpurr . .	2980	15.9.15	22.9.15	273	14½	5,208½	6.19	270.13	200	308

**C. D. LLOYD, Caulfield. (JERSEY.)**

Completed during the year—6. Certificated—6.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Brownbread	Not yet allotted	27.10.14	3.11.14	273	8	3,939½	6.32	248.70	175	189½
Countess Twylish	928	28.10.14	4.11.14	273	21	8,150	5.24	427.50	250	487½
Queen Spark	2533	5.12.14	12.12.14	273	11½	4,522½	6.71	287.19	200	327½
Doreen	2976	6.5.15	13.5.15	273	8½	5,293	5.13	268.93	200	306½
Creambread	Not yet allotted	19.8.15	26.8.15	273	15	5,203	5.97	310.81	175	354½
Sweetbread XIV.	2879	24.8.15	31.8.15	273	16	8,484	5.33	452.42	250	515½

**C. GORDON LYON, Heidelberg. (JERSEY.)**

Completed during the year—14. Certificated—14.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Lassie III. of Banyule	3620	18.10.14	25.10.14	273	9½	3,980	5.01	199.36	175	227½
Lassie	509	23.10.14	30.10.14	273	16	6,997½	5.24	366.50	250	417½
Molly III. of Banyule	3624	6.11.14	13.11.14	273	8	3,790	5.59	211.85	200	241½
Lassie II.	1136	10.12.14	17.12.14	273	25½	8,544	4.91	419.56	250	475½
Ettie IV.	2889	16.12.14	23.12.14	273	25	7,743	4.56	398.86	250	434½
Silver Audrey	1378	19.1.15	26.1.15	273	6½	5,887	4.85	285.74	250	325½
Silvermine III.	715	19.2.15	26.2.15	273	27	8,037½	4.98	400.16	250	456½
Hawthorn of Banyule	1064	16.3.15	23.3.15	273	21½	7,557½	5.09	385.12	250	439
Hawthorn II. of Banyule	3619	1.4.15	8.4.15	273	8	5,451	5.63	307.01	200	350
Velveten II.	2927	2.4.15	9.5.15	273	23	8,361	4.59	383.95	250	437½
Noreen	636	1.8.15	8.8.15	273	23	10,314½	4.59	473.42	250	539½
Parrakeet	3625	31.8.15	7.9.15	273	20	9,827	4.47	438.90	200	500½
Molly IV.	Not yet allotted.	6.9.15	13.9.15	273	9½	5,022	5.38	302.28	175	344½
Molly II.	614	24.9.15	1.10.15	273	16	8,708	4.84	421.80	250	480½

\* An ailment of the udder temporarily affected yield.

† Entry deferred because earlier weights not available.

**J. D. READ, Springhurst. (JERSEY.)**

Completed during the year—25. Certificated—20.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Princess of Springhurst	2521	4.4.15	11.4.15	273	8½	5,869	6.08	355.25	175	405
Princess Deiance of Springhurst	Not yet allotted	8.4.15	15.4.15	273	8	4,522½	5.45	246.89	175	281½
Tulip of Springhurst	2730	10.4.15	17.4.15	273	11	5,735	5.59	320.89	250	365½
Stockings of Springhurst	2663	23.4.15	30.4.15	259	9	5,464	5.06	275.84	250	314½

**J. D. READ, Springhurst. (JERSEY)—continued.**

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Euroa of Springhurst ..	1918	26.4.15	3.5.15	273	lbs. 5	lbs. 4,969½	5.54	lbs. 275.57	lbs. 250	lbs. 314½
Gracful Magnet of Springhurst ..	2068	3.5.15	10.5.15	273	13	6,392	5.37	343.25	250	391½
Musk of Springhurst ..	Not yet allotted	8.5.15	15.5.15	273	11	3,700½	5.56	205.95	175	234½
Balsam of Springhurst ..	1615	21.5.15	28.5.15	273	14	4,221	5.21	220.02	175	250½
Alyske of Springhurst ..	1788	10.6.15	17.6.15	273	8	5,724	5.26	301.07	250	343½
Daisy of Springhurst ..	1788	14.6.15	21.6.15	273	9½	5,673	5.23	296.58	250	338
Granite of Springhurst ..	2059	14.6.15	21.6.15	273	5	5,385½	5.23	281.65	250	321
Hyacinth of Springhurst ..	3705	22.6.15	29.6.15	273	9	3,713	5.89	215.74	200	249½
Arum of Springhurst ..	Not yet allotted	25.6.15	2.7.15	273	10	4,529½	5.34	240.26	175	274
Buttercup of Springhurst ..	3702	27.6.15	4.7.15	273	8	5,369	6.03	323.80	250	369½
Coronia of Springhurst ..	Not yet allotted	5.7.15	12.7.15	273	4	4,031	5.00	201.67	175	230
Shamrock of Springhurst ..	3708	13.7.15	20.7.15	258	4	4,065½	5.14	209.12	200	238½
Foxglove of Springhurst ..	3704	15.7.15	22.7.15	273	4	5,575	4.87	271.48	250	309½
Honeysuckle of Springhurst ..	Not yet allotted	18.7.15	25.7.15	273	9½	4,053½	5.22	211.82	175	241½
Dulce of Springhurst ..	1878	31.7.15	7.8.15	273	6½	5,691	5.79	329.66	250	375½
Nightshade of Springhurst ..	3707	12.8.15	19.8.15	273	22½	8,051	5.10	410.32	250	467½

**Miss S. L. ROBINSON, Malvern. (JERSEY.)**

Completed during the year—6. Certificated—3.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Lotina (imp.) ..	1160	30.9.14	7.10.14	227	lbs. 5	lbs. 6,032½	5.16	lbs. 312.19	lbs. 250	lbs. 356
Larkspur's Charibelle ..	1132	14.10.14	21.10.14	273	17½	6,031	4.79	317.48	350	362
Lotina (imp.) ..	1160	8.8.15	15.8.15	273	19	7,754	5.19	403.95	250	460½

**D. SADLER, Camperdown. (AYRSHIRE.)**

Completed during the year—8. Certificated—1.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Flirt of Kilmarnock ..	3091	4.11.14	11.11.14	273	lbs. 25	lbs. 7,051	3.79	lbs. 267.05	lbs. 250	lbs. 304½

**C. E. WOOD, Frankston. (JERSEY.)**

Completed during the year—2. Certificated—2.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of
					lbs.	lbs.		lbs.	lbs.	lbs.
Jersey May ..	2115	23.11.14	30.11.14	273	8 1/2	7,138 1/2	4'96	353'96	175	403 1/2
White Bell II. ..	3723	25.10.14	*1.12.14	273	9	3,333	5'94	193'01	175	226 1/2

\* Entry deferred until weights available.

**E. N. WOOD, Caulfield. (JERSEY.)**

Completed during the year—2. Certificated—2.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Luxury ..	3725	7.10.14	14.10.14	273	lbs. 17	8,119½	5*40	lbs. 438*83	250	lbs. 500½
Luxury ..	3725	24.9.15	1.10.15	273	23½	9,012	5*01	461*04	250	525½

**W. WOODMASON, Malvern. (JERSEY.)**

Completed during the year—52. Certificated—51.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Daisy VI. of Melrose ..	Not yet allotted	25.9.14	2.10.14	273	10½	4,609½	5*14	241*83	175	276½
Banker VI. of Melrose	3631	26.9.14	3.10.14	273	15	5,402½	5*64	304*76	200	347½
Jessie V. of Melrose ..	3652	5.10.14	12.10.14	273	19½	7,919½	5*28	416*81	250	475½
Edith II. of Melrose ..	Not yet allotted	10.10.14	17.10.14	273	14	5,418	5*48	296*69	175	338½
Flower VI. of Melrose	3641	11.10.14	18.10.14	273	13	5,274½	6*14	324*17	250	369½

## W. WOODMASON, Malvern—continued.

Name of Cow.	Herd Book No.	Date of Calving.	Date of Entry to Test.	No. of Days in Test.	Weight of Milk last Day of Test.	Weight of Milk.	Average Test.	Butter Fat.	Standard Required.	Estimated Weight of Butter.
Graceful Duchess XI. of Melrose ..	Not yet allotted	14.10.14	21.10.14	273	14½	4,470½	6.02	269.29	175	307
Quality VI. of Melrose	3674	20.10.14	27.10.14	273	18	8,349½	5.73	473.44	250	545½
Mystery XII. of Melrose	3687	21.10.14	28.10.14	273	17½	6,565½	5.28	346.48	250	395
Fuchsia X. of Melrose	Not yet allotted	12.11.14	19.11.14	273	16½	5,503	4.51	248.39	175	283½
Daisy V. of Melrose ..	3637	20.11.14	27.11.14	273	18½	6,441	5.27	336.51	200	387
Jessie XII. of Melrose	Not yet allotted	20.11.14	27.11.14	273	18	5,063½	5.99	303.21	175	345½
Rarity VI. of Melrose	3675	27.11.14	4.12.14	273	18½	8,023	5.28	423.48	250	482½
Mystery XIII. of Melrose	3688	2.12.14	9.12.14	273	16	6,044	6.46	390.72	200	445½
Chevy VIII. of Melrose	Not yet allotted	17.12.14	24.12.14	273	19	6,011	5.03	338.56	175	386
Mystery IX. of Melrose	3685	21.1.15	28.1.15	273	23½	7,047½	5.98	421.60	250	480½
Mernaad II. of Melrose	Not yet allotted	1.2.15	8.2.15	273	18	6,733	5.13	345.36	250	393½
Purity IV. of Melrose	1324	6.2.15	13.2.15	273	20	5,634½	5.72	322.48	250	367½
Jessie IX. of Melrose ..	3654	11.2.15	18.2.15	273	22	7,359	5.09	418.62	250	477½
Jessie Fowler III. of Melrose ..	1137	22.2.15	1.3.15	273	23	8,121	5.49	440.29	250	508½
Zoe V. of Melrose ..	1496	22.2.15	1.3.15	273	16½	6,159½	6.59	405.26	250	462
Jenny Lind VIII. of Melrose ..	3651	18.3.15	25.3.15	273	13	6,332	5.47	346.38	200	394½
Rarity V. of Melrose ..	1344	20.3.15	27.3.15	273	20	8,183½	5.24	429.06	250	489
Mystery VIII. of Melrose ..	3664	25.3.15	1.4.15	273	15½	6,027	6.13	369.68	250	421½
Laura VI. of Melrose ..	3658	5.4.15	12.4.15	273	14	7,172	5.89	416.56	250	474½
Jessie's Progress ..	3657	16.4.15	23.4.15	273	18½	7,754½	5.96	464.25	250	529½
Pearl III. of Melrose ..	Not yet allotted	20.4.15	27.4.15	273	9	4,016½	6.49	260.62	175	297
Lady Melrose IV. ..	"	27.4.15	4.5.15	273	18½	7,336	4.92	360.99	200	411½
Jessie XIII. of Melrose	"	5.6.15	12.6.15	273	15½	5,261½	6.21	327.17	175	375
Vanilla VI. of Melrose	"	12.7.15	19.7.15	273	15½	7,053	4.44	313.85	250	357½
Graceful Duchess X. of Melrose ..	3646	18.7.15	25.7.15	273	11	5,665	6.04	336.63	200	383½
Merry Girl IV. of Melrose ..	3662	30.7.15	6.8.15	273	11	6,023½	5.38	325.10	250	370½
Graceful Duchess VIII. of Melrose ..	1056	10.8.15	17.8.15	273	26½	9,026	5.28	476.95	250	543½
Jessie VI. of Melrose ..	Not yet allotted	10.8.15	17.8.15	273	13½	8,342	6.27	523.34	250	596½
Polly II. of Melrose ..	"	12.8.15	19.8.15	273	15½	7,161	4.96	355.57	200	405½
Pearl of Melrose ..	3669	13.8.15	20.8.15	273	18	7,511½	4.57	343.94	250	392
Waverley Lass II. of Melrose ..	Not yet allotted	16.8.15	23.8.15	273	9	3,845½	6.06	238.37	175	266
Jessie XI. of Melrose ..	3650	18.8.15	25.8.15	273	16½	7,317½	5.89	430.21	250	490½
Vanilla V. of Melrose ..	3678	18.8.15	25.8.15	273	14	8,644½	4.54	392.98	230	448
Jessie VIII. of Melrose	3653	22.8.15	29.8.15	273	18	7,268½	5.28	384.50	250	438½
Fuchsia XI. of Melrose	Not yet allotted	23.8.15	30.8.15	273	9½	4,134	5.64	283.54	175	266½
Peerless VII. of Melrose	3672	23.8.15	30.8.15	273	11	5,931½	5.15	306.94	250	350
Empire V. of Melrose	Not yet allotted	24.8.15	31.8.15	273	14½	6,696½	5.22	353.64	200	403½
Lizzie VI. of Melrose ..	"	26.8.15	2.9.15	273	7	5,082	4.60	234.22	200	287
Sweet Pansy II. of Melrose ..	"	28.8.15	4.9.15	273	8	3,850½	5.73	220.82	175	251½
Handsome Girl VII. of Melrose ..	"	29.8.15	5.9.15	273	12½	4,829	6.68	320.63	175	365½
Sweet Pansy of Melrose	1413	31.8.15	7.9.15	273	7	6,394½	5.67	300.23	250	349
Lady Elector II. of Melrose ..	Not yet allotted	3.9.15	10.9.15	273	11	4,421½	5.94	262.85	175	299½
Jessie X. of Melrose ..	3655	4.9.15	11.9.15	273	14½	6,716	5.24	352.02	250	401½
Carrie V. of Melrose ..	3634	7.9.15	14.9.15	273	15	6,580½	5.26	346.26	250	394½
Peerless VIII. of Melrose ..	3673	2.9.15	16.9.15	273	15	7,108	5.48	390.26	250	445
Gaiety Girl VIII. of Melrose ..	Not yet allotted	15.9.15	22.9.15	273	11	4,759	5.39	256.53	175	292½

\* Entry extended seven days as weights not available.

## COWS IN ORDER OF MERIT.

Cows over 4 years of Age or on third lactation period—250 lbs. Standard.

Order of Merit.	Name of Cow.	Red Book No.	Owner.	Breed.	Milk.	Average Yield.	Butter Fat.	Butter.
					lbs.		lbs.	lbs.
1	Jessie VI. of Melrose ..	..	W. Woodmason ..	Jersey ..	8,342	6·27	523·34	564
2	Lady Grey V. ..	3756	A. W. Jones ..	..	9,615	5·11	491·59	564
3	Birdseye ..	..	Department of Agriculture ..	Red Poll ..	7,573	6·42	485·95	554
4	Quality VI. of Melrose ..	3674	W. Woodmason ..	Jersey ..	8,340	5·73	478·41	545
	Graceful Duchess VIII. of Melrose ..	1056	W. Woodmason ..	..	9,026	5·28	476·95	543
6	Noreen ..	636	C. G. Lyon ..	..	10,314	4·59	473·42	539
7	Jessie's Progress ..	3657	W. Woodmason ..	..	7,784	5·96	464·28	529
8	Luxury ..	3725	E. N. Wood ..	..	9,012	5·01	461·04	524
9	Sweetbread ..	2979	C. D. Lloyd ..	..	8,484	5·33	452·42	519
10	Lassie Fowler III. of Melrose ..	1137	W. Woodmason ..	..	8,121	5·49	448·29	506
11	Luxury ..	3725	E. N. Wood ..	..	8,119	5·40	438·83	500
12	Jessie XI. of Melrose ..	3656	W. Woodmason ..	..	7,317	5·89	430·21	490
13	Hartley V. of Melrose ..	1344	W. Woodmason ..	..	8,183	5·24	429·05	489
14	Conness Twelfth ..	928	C. D. Lloyd ..	..	8,150	5·24	427·50	487
15	Rarity VI. of Melrose ..	3675	W. Woodmason ..	..	8,023	5·28	423·48	482
16	Molly II. ..	614	C. G. Lyon ..	..	8,708	4·84	421·80	480
17	Mystery IX. of Melrose ..	3665	W. Woodmason ..	..	7,047	5·98	421·60	480
18	Lassie II. ..	1136	C. G. Lyon ..	..	8,544	4·91	419·56	478
19	Jessie IX. of Melrose ..	3654	W. Woodmason ..	..	7,359	5·09	418·62	477
20	Jessie V. of Melrose ..	3652	W. Woodmason ..	..	7,914	5·26	416·81	475
21	Laura VI. of Melrose ..	3658	W. Woodmason ..	..	7,172	5·80	416·36	474
22	Nightshade of Springhurst ..	3707	J. D. Read ..	..	8,051	5·10	410·32	467
23	Zoe V. of Melrose ..	1496	W. Woodmason ..	..	6,159	6·58	405·26	462
24	Lodina ..	1160	Miss S. L. Robinson ..	..	7,781	5·19	403·95	460
25	Netherlana ..	..	Department of Agriculture ..	Red Poll ..	9,455	4·25	402·03	458
26	Silvermine III. ..	715	C. G. Lyon ..	Jersey ..	8,037	4·98	400·16	456
27	Elkie IV. ..	2389	C. G. Lyon ..	..	8,743	4·56	392·86	454
28	Vanilla V. of Melrose ..	3678	W. Woodmason ..	..	8,044	4·54	392·96	454
29	Peerless VIII. of Melrose ..	3673	W. Woodmason ..	..	7,108	5·48	390·26	445
30	Hawthorn of Baayule ..	1064	C. G. Lyon ..	..	7,557	5·09	385·12	439
31	Jessie VIII. of Melrose ..	3653	W. Woodmason ..	..	7,264	5·28	384·50	438
32	Velveteen II. ..	2927	C. G. Lyon ..	..	8,361	4·59	383·93	437
33	Mystery VIII. of Melrose ..	3664	W. Woodmason ..	..	6,027	6·13	369·68	421
34	Aradia ..	1534	C. G. Knight ..	..	6,954	5·31	369·55	421
35	Lassie ..	509	C. G. Lyon ..	..	6,997	5·24	366·50	417
36	Mythic ..	2404	C. G. Knight ..	..	7,006	5·09	361·27	414
37	Cuba ..	..	Department of Agriculture ..	Red Poll ..	7,924	4·55	360·82	411
38	Larkspur's Claribelle VI. ..	3772	A. Box ..	Jersey ..	7,533	4·72	355·52	409
39	Princess of Springhurst ..	2521	J. D. Read ..	..	5,869	6·05	355·28	405
40	Jersey May ..	2115	C. E. Wood ..	..	7,139	4·96	353·06	403
41	Ruby of Glen Elgin ..	1836	Geelong Harbor Trust ..	Ayrshire ..	8,538	4·13	352·98	402
42	Jessie X. of Melrose ..	3655	W. Woodmason ..	Jersey ..	6,716	5·24	352·02	401
43	Kentucky ..	..	Department of Agriculture ..	Red Poll ..	9,032	3·88	350·67	399
44	Mexicana ..	..	Department of Agriculture ..	..	7,909	4·39	349·54	398
45	Mystery XII. of Melrose ..	3667	W. Woodmason ..	Jersey ..	6,565	5·28	346·48	395
46	Carrie V. of Melrose ..	3634	W. Woodmason ..	..	6,580	5·26	346·26	394
47	Mermald II. of Melrose ..	..	W. Woodmason ..	..	6,733	5·13	345·36	393
48	Pearl of Melrose ..	3669	W. Woodmason ..	..	7,514	4·57	343·94	392
49	Graceful Magnet of Springhurst ..	2058	J. D. Read ..	..	6,392	5·37	343·25	391
50	Phillipina ..	..	Department of Agriculture ..	Red Poll ..	7,122	4·82	343·13	391
51	Connecticut ..	..	Department of Agriculture ..	..	7,204	4·75	342·36	390
52	Perlica ..	..	Department of Agriculture ..	..	6,797	4·98	335·39	383
53	India ..	..	Department of Agriculture ..	..	8,146	4·11	335·23	382
54	Vuelta ..	..	Department of Agriculture ..	..	8,311	4·03	334·59	381
55	Sumatra ..	..	Department of Agriculture ..	..	7,494	4·40	329·71	376
56	Dulcie of Springhurst ..	1878	J. D. Read ..	Jersey ..	5,691	5·79	329·60	375
57	Pennsylvania ..	..	Department of Agriculture ..	Red Poll ..	8,203	4·00	327·96	373



COWS OVER 4 YEARS OF AGE OR ON THIRD LACTATION PERIOD—250 LBS. STANDARD—continued.

Order of Merit.	Name of Cow.	Herd Book No.	Owner.	Breed.	Milk.	Average Test.	Butter Fat.	Butter.
					lbs.		lbs.	lbs.
54	Merry Girl IV. of Melrose ..	3662	W. Woodmason ..	Jersey ..	6,024½	5.38	329.10	370½
55	Flower VI. of Melrose ..	3641	W. Woodmason ..	" ..	5,274½	6.14	324.17	360½
59	Buttercup of Springhurst ..	3702	J. D. Read ..	" ..	5,399	6.03	322.80	369½
60	Purity IV. of Melrose ..	1324	W. Woodmason ..	" ..	5,634½	5.72	322.48	367½
62	Tulip of Springhurst ..	2730	J. D. Read ..	" ..	5,735	5.59	320.89	365½
63	Protee ..	..	Department of Agriculture	Red Poll	7,317	4.34	317.76	362½
64	Larkspur's Claribelle ..	1132	Miss S. L. Robinson	Jersey ..	6,631	4.79	317.46	362
65	Turka ..	..	Department of Agriculture	Red Poll	6,362½	4.96	315.92	360½
66	Vanilla VI. of Melrose ..	..	W. Woodmason ..	Jersey ..	7,053	4.44	313.85	357½
67	Lotina ..	1160	Miss S. L. Robinson	" ..	6,052½	5.16	312.19	356
68	Bullion ..	..	Department of Agriculture	Red Poll	7,121	4.38	311.79	355½
69	Peerless VII. of Melrose ..	3672	W. Woodmason ..	Jersey ..	5,931½	5.15	306.94	350
70	Sweet Eassy of Melrose ..	1413	W. Woodmason ..	" ..	5,394½	5.67	306.23	349
71	Aisyke of Springhurst ..	1515	J. D. Read ..	" ..	5,724	5.26	301.07	343½
72	Daisy of Springhurst ..	1788	J. D. Read ..	" ..	5,873	5.23	296.56	338
73	Primrose League ..	..	Department of Agriculture	Red Poll	6,631	4.34	296.27	337½
74	Ardath ..	..	Department of Agriculture	" ..	6,189½	4.78	296.05	337½
75	Goldleaf ..	..	Department of Agriculture	" ..	6,865	4.43	295.62	337
76	Asiana ..	..	Department of Agriculture	" ..	6,367	4.63	293.00	336½
77	Amy Castles ..	1520	C. G. Knight ..	Jersey ..	5,542	5.29	293.16	334½
78	Queen Spark ..	2533	C. D. Lloyd ..	" ..	4,282½	6.71	287.19	327½
79	Silver Audrey ..	1378	C. G. Lyon ..	" ..	5,847	4.85	285.74	325½
80	Lily of Tarnparr ..	2221	C. G. Knight ..	" ..	6,293	4.53	285.03	325
81	Granite of Springhurst ..	2059	J. D. Read ..	" ..	5,383½	5.23	281.66	321
82	Canco ..	..	Department of Agriculture	Red Poll	5,873½	4.72	277.92	316½
83	Stockings of Springhurst ..	2663	J. D. Read ..	Jersey ..	5,464	5.05	275.84	314½
84	Enroa of Springhurst ..	1918	J. D. Read ..	" ..	4,969½	5.54	275.57	314½
85	Roseneath Daphne ..	3774	A. Rox ..	" ..	4,968	5.48	272.38	310½
86	Foxglove of Springhurst ..	3704	J. D. Read ..	" ..	5,575	4.87	271.48	309½
87	Idyll's Ideal ..	2096	C. G. Knight ..	" ..	5,426½	4.96	269.49	307½
88	Flirt of Kilmarnock ..	3091	D. Sadler ..	Ayrshire ..	7,051	3.79	267.05	304½
89	Areadia ..	1534	C. G. Knight ..	Jersey ..	4,842½	5.49	265.90	303
90	Roseneath Fox's Tynlsh ..	3775	A. Rox ..	" ..	4,359	5.33	263.43	302½
91	Gipsy Maid of Glen Elgin ..	1818	Geelong Harbor Trust	Ayrshire ..	6,180	4.27	261.09	301
92	Winnie of Glen Elgin ..	1850	Geelong Harbor Trust	" ..	6,265½	4.18	262.20	299
93	Alpina ..	..	Department of Agriculture	Red Poll	6,357	4.00	254.23	289½

## Cows under 4 Years of Age—200 lbs. Standard.

Order of Merit.	Name of Cow.	Herd Book No.	Owner.	Breed.	Milk.	Average Test.	Butter Fat.	Butter.
					lbs.		lbs.	lbs.
1	Parrakeet ..	3625	C. G. Lyon ..	Jersey ..	4,827	4.47	438.90	500½
2	Mystery XIII. of Melrose ..	3663	W. Woodmason ..	" ..	6,044	6.46	389.72	445½
3	Lady Grey VIII. ..	..	A. W. Jones ..	" ..	7,126½	5.35	351.76	455½
4	Lady Melrose IV. ..	..	W. Woodmason ..	" ..	7,336	4.92	360.99	411½
5	Violet III. ..	..	Department of Agriculture	Red Poll	7,940½	4.49	358.85	406½
6	Polly II. of Melrose ..	..	W. Woodmason ..	Jersey ..	7,161	4.96	355.57	405½
7	Empire V. of Melrose ..	..	W. Woodmason ..	" ..	6,696½	5.22	353.64	403½
8	Jenny Lind VIII. of Melrose ..	3651	W. Woodmason ..	" ..	6,332	5.47	346.38	394½
9	Daisy V. of Melrose ..	3637	W. Woodmason ..	" ..	6,441	5.27	339.51	387
10	Graceful Duchess X. of Melrose ..	3646	W. Woodmason ..	" ..	5,565	6.04	336.63	383½
11	Sparkle ..	..	..	..	5,091	6.37	321.45	369½
12	Lily ..	2978	T. Harvey ..	Red Poll	7,077½	4.55	322.35	367½

## COWS UNDER 4 YEARS OF AGE—200 LBS. STANDARD—continued.

Order of Merit.	Name of Cow.	Herd Book No.	Owner.	Breed.	Milk.	Average Test.	Butter Fat.	Butter.
					lbs.		lbs.	lbs.
13	Mongolia .. ..	..	Department of Agriculture	Red Poll ..	7,415	4*30	315*81	3644
14	Peerless Pearl .. ..	3771	F. Curnick .. ..	Jersey ..	6,017	5*27	317*23	3614
15	Ruby of Sparrowale .. ..	2512	Geelong Harbor Trust	Ayrshire ..	7,178	4*37	310*42	3577
16	Dolly .. ..	3754	A. W. Jones .. ..	Jersey ..	4,938½	6*24	306*23	3514
17	Hawthorn II. of Banyule .. ..	3619	C. G. Lyon .. ..	" ..	5,451	5*43	307*01	3504
18	Banker VI. of Melrose .. ..	3631	W. Woodmason .. ..	" ..	5,402½	5*64	304*76	3474
19	La Reina .. ..	..	Department of Agriculture	Red Poll ..	6,004½	4*96	297*65	3394
20	Pipio .. ..	..	Department of Agriculture	" ..	5,906½	5*04	297*49	3394
21	Eva .. ..	3770	F. Curnick .. ..	Jersey ..	6,216½	4*78	297*26	3384
22	Blue Bell of Pine Hills .. ..	2975	T. Harvey .. ..	" ..	5,079	5*82	295*86	3277
23	Romany Lass .. ..	2563	C. G. Knight .. ..	" ..	5,032½	5*63	285*50	3224
24	Mistletoe of Tamprir .. ..	2984	C. G. Knight .. ..	" ..	5,282	5*29	279*33	3184
25	Primrose of Tamprir .. ..	2985	C. G. Knight .. ..	" ..	4,655	5*81	270*80	3084
26	Bonnie of Tamprir .. ..	2980	C. G. Knight .. ..	" ..	5,208½	5*19	270*13	3084
27	Doreen .. ..	2976	C. D. Lloyd .. ..	" ..	5,238	5*13	268*93	3064
28	Britannia .. ..	..	Department of Agriculture	Red Poll ..	6,889½	3*92	268*81	3064
29	Foxglove of Tamprir .. ..	2983	C. G. Knight .. ..	Jersey ..	4,512½	5*89	265*96	3034
30	Roseneath Favourite IV. .. ..	..	A. Box .. ..	" ..	5,821	4*45	339*13	3594
31	Samorna .. ..	..	Department of Agriculture	Red Poll ..	5,400½	4*71	254*08	2944
32	Panama .. ..	..	Department of Agriculture	" ..	5,869	4*23	248*45	2834
33	Princess of Tamprir .. ..	2986	C. G. Knight .. ..	Jersey ..	4,835	5*09	246*28	2894
34	Carriba .. ..	..	Department of Agriculture	Red Poll ..	5,518	4*29	236*92	2704
35	Sylvia .. ..	..	Department of Agriculture	" ..	4,899	4*78	231*43	2674
36	Lizzie VI. of Melrose .. ..	..	W. Woodmason .. ..	Jersey ..	5,082	4*60	234*29	2674
37	Madge .. ..	3375	Mrs. A. Black .. ..	" ..	4,824½	5*04	233*04	2634
38	Roseneath Sylvia .. ..	3776	A. Box .. ..	" ..	4,305	5*39	232*29	2644
39	Sweetheart of Tamprir .. ..	2987	C. G. Knight .. ..	" ..	5,056	4*55	231*08	2634
40	Princess Edith of Gowrie Park .. ..	2876	Geelong Harbor Trust	Ayrshire ..	5,488½	4*19	229*85	2634
41	Japan .. ..	..	Department of Agriculture	Red Poll ..	6,568	3*50	229*74	2624
42	Dolly of Clydebank II. .. ..	3742	Mrs. A. Black .. ..	Jersey ..	3,596	6*32	227*46	2594
43	Hyacinth of Springhurst .. ..	3705	J. D. Read .. ..	" ..	3,713	5*89	218*74	2494
44	Bridesmaid of Tamprir .. ..	2981	C. G. Knight .. ..	" ..	4,634½	4*56	212*24	2424
45	Molly III. of Banyule .. ..	3624	C. G. Lyon .. ..	" ..	3,790	5*59	211*85	2414
46	Shantock of Springhurst .. ..	3708	J. D. Read .. ..	" ..	4,065½	5*14	209*12	2384
47	Tennessee .. ..	..	Department of Agriculture	Red Poll ..	5,075½	4*09	207*77	2394

## Heifers—175 lbs Standard.

Order of Merit.	Name of Cow.	Herd Book No.	Owner.	Breed.	Milk.	Average Test.	Butter Fat.	Butter.
					lbs.		lbs.	lbs.
1	Lady Grey I. of St. Albans	Not yet allotted	A. W. Jones	Jersey	5,255	6*61	347*35	3964
2	Chevy VIII. of Melrose	..	W. Woodmason	..	6,011	5*63	338*56	3884
3	Jessie XIII. of Melrose	..	W. Woodmason	..	5,261½	6*21	327*17	3734
4	Handsome Girl VII. of Melrose	..	W. Woodmason	..	4,829	6*63	320*63	3644
5	Creambread	..	C. D. Lloyd	..	5,203	5*97	316*21	3544
6	Jessie XII. of Melrose	..	W. Woodmason	..	5,063½	5*99	303*21	3434
7	Molly IV.	..	C. G. Lyon	..	5,622	5*38	302*28	3444
8	Dainty VI.	..	T. Harvey	..	5,306	5*66	306*33	3424
9	Edith II. of Melrose	..	W. Woodmason	..	5,418	5*48	299*69	3384
10	Graceful Duchess XI. of Melrose	..	W. Woodmason	..	4,470½	6*02	262*23	3074

## HEIFERS—175 LBS. STANDARD—continued.

Order of Rank	Name of Cow.	Herd Book No.	Owner.	Breed.	Milk.	Average Test.	Butter Fat.	Butter.
					lbs.	lbs.	lbs.	lbs.
11	Lady Elector II. of Melrose	..	W. Woodmason	Jersey	4,421½	5'94	262'85	290½
12	Pearl III. of Melrose	..	W. Woodmason	..	4,016½	5'49	260'62	297
13	Gaiety Girl VIII. of Melrose	..	W. Woodmason	..	4,759	5'39	256'53	292½
14	Lady Marce IV.	..	T. Harvey	..	4,718½	5'43	256'21	292
15	Brownbread	..	C. D. Lloyd	..	3,926½	5'32	248'70	283½
16	Fuchsia X. of Melrose	..	W. Woodmason	..	5,503	4'51	248'39	283½
17	Princess Defiance of Springhurst	..	J. D. Read	..	4,528½	5'45	246'89	281½
18	Daisy VI. of Melrose	..	W. Woodmason	..	4,699½	5'14	241'83	275½
19	Arundel of Springhurst	..	J. D. Read	..	4,529½	5'34	240'26	274
20	Fuchsia XI. of Melrose	..	W. Woodmason	..	4,134	5'64	233'54	266½
21	Waverley Lass II. of Melrose	..	W. Woodmason	..	3,845½	5'08	233'37	266
22	Bridesmaid of Tarnpitt	2981	C. G. Knight	..	4,676	4'85	229'60	258½
23	Alice of Tarnpitt	..	C. G. Knight	..	3,870	5'80	224'60	256
24	Sweet Pansy II. of Melrose	..	W. Woodmason	..	3,850½	5'73	220'82	251½
25	Balsam of Springhurst	..	J. D. Read	..	4,221	5'21	220'02	250½
26	Gipsy Maid II. of Sparrovale	2511	Geelong Harbor Trust	Ayrshire	4,016	4'40	216'12	246½
27	Lass Favourite	..	A. Box	Jersey	4,881½	4'42	215'82	246
28	Honeysuckle of Springhurst	..	J. D. Read	..	4,053½	5'22	211'82	241½
29	Musk of Springhurst	..	J. D. Read	..	3,700½	5'56	205'95	234½
30	Soudana	..	Department of Agriculture	Red Poll	4,707	4'40	207'17	236½
31	May's Gem	..	A. Box	Jersey	4,176½	4'91	205'29	234
32	Roseneath Twyllish	..	A. Box	..	3,884	5'21	202'58	231
33	Beronia of Springhurst	..	J. D. Read	..	4,081	5'00	201'67	230
34	Laurel	..	Department of Agriculture	Red Poll	5,006½	4'02	201'41	229½
35	Ontario	..	Department of Agriculture	..	4,730	4'21	199'68	227½
36	Lassie III. of Banyule	3620	C. G. Lyon	Jersey	3,980	5'01	190'36	227½
37	White Bell II.	3728	C. E. Wood	..	3,533	5'94	186'01	225½
38	Italia	..	Department of Agriculture	Red Poll	4,693	4'14	184'30	221½
39	Russia	..	Department of Agriculture	..	4,933	3'82	188'69	215
40	Pachica	..	Department of Agriculture	..	3,866½	4'76	184'02	209½
41	Serbia	..	Department of Agriculture	..	4,271	4'22	179'79	205

## HERD AVERAGES.

## W. WOODMASON'S "Melrose" Herd.

Cows of Herd in their Respective Classes.					Butter Fat.	Average.
					lbs.	
28	Mature Cows yielded	..	..	..	10,920'34	390'01
9	Second-calf Cows yielded	..	..	..	..	335'74
	Handicap of 50 lbs. each	..	..	..	3,471'65	
14	Heifers yielded	..	..	..	..	272'39
	Handicap of 75 lbs. each	..	..	..	4,863'50	
	Return without herd allowance	..	..	..	19,255'49	377'56
51	Cows in herd allowed 25½ lbs. each (equal to ¼ lb. per cow)	..	..	..	1,300'50	
	Herd total, including all handicap allowances	..	..	..	20,555'99	403'05

## G. G. LYON'S "Banyule" Herd.

Cows of Herd in their Respective Classes.					Butter Fat.	Average.
					lbs.	
9 Mature Cows yielded	..	..	..	..	3,523.37	391.48
3 Second-calf Cows yielded	..	..	..	957.76 lbs.	..	316.25
Handicap of 50 lbs. each	..	..	..	150.00 lbs.	1,107.76	
2 Heifers yielded	..	..	..	501.64 lbs.	..	250.82
Handicap of 75 lbs. each	..	..	..	150.00 lbs.	651.64	
Return without herd allowance	..	..	..	..	5,282.77	377.33
14 Cows in herd allowed 7 lbs. each (equal to $\frac{1}{4}$ lb. per cow)	..	..	..	..	98.00	
Herd total, including all handicap allowances	..	..	..	..	5,380.77	384.33

## DEPARTMENT OF AGRICULTURE, Research Farm Herd.

Cows of Herd in their Respective Classes.					Butter Fat.	Average.
					lbs.	
25 Mature Cows yielded	..	..	..	..	7,778.88	327.32
13 Second-calf Cows yielded	..	..	..	3,453.53 lbs.	..	265.65
Handicap of 50 lbs. each	..	..	..	650.00 lbs.	4,103.53	
8 Heifers yielded	..	..	..	1,516.85 lbs.	..	185.60
Handicap of 75 lbs. each	..	..	..	600.00 lbs.	2,116.85	
Return without herd allowance	..	..	..	..	13,999.26	304.33
46 Cows in herd allowed 23 lbs. each (equal to $\frac{1}{4}$ lb. per cow)	..	..	..	..	1,058.00	
Herd total, including all handicap allowances	..	..	..	..	15,057.26	327.33

## J. D. READ'S "Springhurst" Herd.

Cows of Herd in their Respective Classes.					Butter Fat.	Average.
					lbs.	
15 Mature Cows yielded	..	..	..	..	4,494.83	299.65
2 Second-calf Cows yielded	..	..	..	427.86 lbs.	..	213.93
Handicap of 75 lbs. each	..	..	..	150.00 lbs.	677.86	
8 Heifers yielded	..	..	..	1,610.61 lbs.	..	201.32
Handicap of 75 lbs. each	..	..	..	600.00 lbs.	2,210.61	
Return without herd allowance	..	..	..	..	7,283.30	291.33
25 Cows in herd allowed 12 $\frac{1}{2}$ lbs. each (equal to $\frac{1}{4}$ lb. per cow)	..	..	..	..	312.50	
Herd total, including all handicap allowances	..	..	..	..	7,595.80	303.83

## NOTES ON PORTUGUESE VINE VARIETIES.

*By F. de Castella, Government Viticulturist.*

(Continued from page 408.)

Bastardo and Touriga, which will form the subject of the next articles differ widely from one another and from Alvarelhao (described in last issue). The last named appears to be mainly responsible for the curious "dry finish" of a high grade Port, but this is only one of the characteristics of this remarkable wine. The special character of its bouquet and its flavour seem to be largely dependent on Bastardo, whilst Touriga is of, perhaps, equal importance in the direction of colour and body. It is the judicious combination and treatment of the fruit of these three, and of several other sorts to be described later, which result in what is known the world over as Port wine.

These three sorts differ from each other to such an extent as to really constitute three distinct types, to one or other of which each of the other varieties used in the making of Port may be said to belong.

## BASTARDO.

This variety seems to be responsible for several of the leading features of Port, more especially of the lighter-coloured type known as tawny Port. The wine yielded by Bastardo, like that of Grenache, contains a considerable percentage of alcohol. It is also remarkable for the instability of its colour, rapidly developing the tawny or onion-peel tint as it is termed in France, and the peculiar character known as the "rancio" taste. The small extent to which Grenache is grown on the Douro is perhaps explained by the fact that Bastardo possesses several of its leading peculiarities. Bastardo ripens earlier than Grenache; perhaps, too early, in fact, for northern Victoria. This is a question which can only be answered by practical trial on a large scale, which must also decide as to whether and to what extent the one sort can replace the other in order to communicate a tawny colour and "rancio" taste to wines of Port type.

Bastardo is one of the oldest Portuguese varieties, it is mentioned as long ago as 1532 by Ruy Fernandez\* as entering into the composition of a marvellous wine. Vincencio Alarte† speaks of Bastardo as a very good grape, excellent to eat, and which, though poor in colour, softens the wine marvellously by its excellent sweetness, and gives its much freshness (*novidade*, literally novelty).

Rebello da Fonseca (1791) refers to Bastardo as softening the roughness of Alvarelhao and other grapes (see last issue). He deals with the curious fallacy that Bastardo should be identical with Pinot of Burgundy and Champagne, a subject mentioned by other Portuguese writers. The two sorts are really very different, and it is difficult to find how the idea originated. The supposed similarity led to a trial which he describes as follows:—

"On 21st December, 1789, I tasted a wine that Jose João Pinto de Queiroz e Figueiredo, Chief Captain of Penaguiao, had ordered to be made, the previous year, in imitation of Champagne, extracted from Bastardo grapes without any

\* An interesting description of agriculture in the neighbourhood of Lamego, a town situated about the middle of the Douro Valley.

† Pseudonym, adopted by Sylvestre Gomes de Moraes, who published a work on Portuguese viticulture in 1711.

mixture, and I found it much superior to all that were tasted—even to Champagne."

Seeing that the wine was only a year old this confirms the rapid maturation of the wine made from Bastardo. Fonseca further states:—

"This variety produces much in all classes of soil but as its grapes are very subject to dry up and also to rot, a year seldom occurs in which they can be

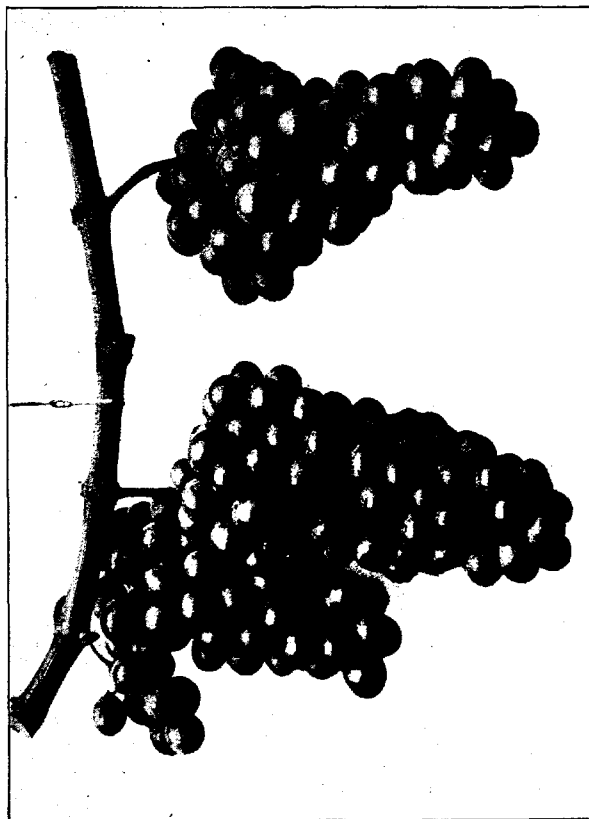


Fig. 5.—Bunches of Bastardo Grapes.

Reproduced from *O Portugal Vinícola*, by B. C. Cincinnato da Costa, reduced to half natural size.

vintaged in perfection; besides this defect they have another, viz., that if crushed alone, or even if present in great proportion, they are not capable of yielding a wine of much duration; the wines of Gaivosa, on the Alto Douro, in which there is a large proportion of Bastardo, are choice (*finos*), delicate, of an exquisite flavour and excellent bouquet, but nevertheless they are poor in colour and body, and do not keep so well as others of the Alto Douro; in the trade they are not classed as wines of colour and body, even though they contain a fair proportion of Alvarelhão and other sorts."

Gyrao (1822) also mentions Bastardo as producing a good wine of little colour—

"On stiff soil it rots easily, on hot hillsides it dries up; hence it is only suitable for soils of medium strength on the flanks of the higher hills (*Nas encostas dos montes*). . . . Bastardo gives a wine of the most delicate flavour; for this reason everybody buys it to eat, nevertheless its wine is soft (*molle*) and of very little colour, for which reason only a portion of it should enter into a wine."

According to the same author, Bastardo would seem to be a good variety for making white Ports—

"From nearly all the vineyards of Penaguiao, especially the older ones where there is much Bastardo, a great quantity of wine could be obtained similar to the Tokay of Hungary, which finds its way to Odessa in small quantities, as it has to make the transit by land. This wine is much appreciated there, and if

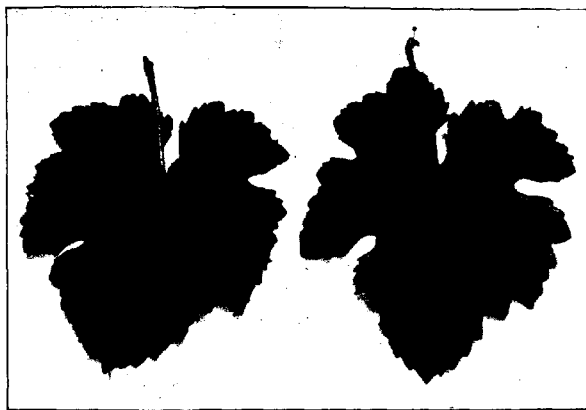


Fig. 6.—Leaves of Bastardo (about one-third natural size).

Photo. taken at Quinta da Boa Vista, Alto Douro, Portugal, in October, 1907.

the owners of Penaguiao were to produce something similar, well and judiciously made, it could also be sold, perhaps even in England, at 100,000 reis per pipe."

The Visconde de Villa Maior (1865-9) has written a good deal concerning this vine.

"At Vesuvio it is planted separately, as it should be, on account of its being very early in its ripening. It ought to be before other varieties and separately as a special wine."

He enumerates the leading vineyards in which it is largely grown, stating that it is well known throughout the whole of Portugal as being the earliest of those grapes which are suitable for table purposes, ripening in most seasons in the beginning of July. It is also the basis of a specially choice wine which completes and perfects itself at a very early age. He describes two sub-varieties of this vine which are held in little esteem as being inferior and semi-sterile. This seems to indicate that Bastardo is a variety prone to deterioration, and which is capable of

improvement by rigorous scion selection. He quotes Rebello da Fonseca as follows:—

"It must be borne in mind that the wines of Baixo Corgo are mainly made of Bastardo and Alvarinho; in addition to these, throughout the Douro, special wines are made from this grape (Bastardo); they are liquorous, sweet, and very choice. Those of Lavadouro are also made with Bastardo in large proportion."

The wine of Bastardo appears to be prone to fermentation troubles, according to several different writers.

Conselheiro Aguiar (1866) states that:—

"The must is thick and fermentation tumultuous and protracted. It is deficient in colour and body, and produces an over-ripe wine."

Ferreira (1866) states that:—

"At Barreiro, Bastardo must for a special wine had a sugar strength of 32 per cent. (genuine alcohol strength 15.6 per cent.)\* In this locality the sweeter the grapes the longer the fermentation which is given to the must. With Bastardo, for example, if it is not allowed to remain for eight days fermenting on the skin, it turns and is spoilt."

Apparently fearing that he might disparage the wines of the district, he naively adds—

"Nevertheless, neither this nor the other wines of the locality are harsh (*saem traventos*), rather are they suave and soft, which is to be explained very naturally, owing to the influence of the sunlight, which causes the skin to lose the bitterness of the tannin."

Figueiredo (1875) states that Bastardo produces a generous wine, only slightly astringent, remarkably aromatic, though little charged with colour. It requires very thorough trampling and long fermentation. In Beira Alta there are two varieties of this vine which produce a balsamic and generous wine, which forms the best blend possible with Tourigo and Alvarinho.

That Bastardo must is remarkable for high gravity is shown by the determinations cited by the following authors:—

Ferreira Lapa (1866)—32 per cent. sugar (16.8 Beaumé).

Conselheiro Aguiar (1866)—33.18 per cent. sugar (17.5 Beaumé), acid 0.47 per cent. (as sulphuric).

Villa Maior (1875)—S.G. 1.140—acid 0.23 per cent. (as sulphuric).

Dr. Alberto Sampaio (1878)—mentions that the gravities of Bastardo must were as follow:—12° B. in 1873, 14° in 1874, and 15°† in 1875.

Several authorities consider it to be very liable to Oidium. D. Fernando de Sousa Coutinho states that near Lisbon it is attacked by Anthracnosis, but not with much intensity.

The following information is abridged from the article on Bastardo by Sr. Cincinnato da Costa in *O Portugal Vinicola*:—

"Bastardo is one of the most widespread Portuguese varieties. It is a black grape, especially remarkable for its high sugar strength and the delicacy of its perfume. It is cultivated in nearly all the different viticultural regions of Portugal, and always influences in a marked manner the quality of the wines into the composition of which it enters.

"On the Douro Bastardo is almost always associated with Alvarinho, the two constituting the basis of the best vineyards where the excellent wines of Porto are produced; it is everywhere treated as a choice variety worthy of the best attention of vine growers.

"At Lavadouro, near Lisbon, the same vine appears to be cultivated under the name of Bastardino. It seems here to be slightly different in appearance, no doubt owing to altered surroundings, both bunch and berry being rather smaller

\* Absolute alcohol, by volume.

† The Beaumé strengths given in brackets have been worked out from the sugar strengths according to the usual French tables.



"Villa Maior is quoted as stating that Bastardo yields 51.8 per cent. of choice must, lightly rose-coloured, of density 1.140 (17 deg. 7 Beaumé), containing 23.285 per cent. sugar and 0.23 per cent. acid. Sr. da Costa quotes somewhat different percentages.

"Bastardo crushed alone produces a generous wine, very agreeable and of great flavour (*Grande flavor*), a wine which as a rule ages early, attaining at the end of two years the characteristic colour of onion peel. Under the microscope the must, which is of rosy colour, shows a very considerable number of ferments, the cells being turgid and very active."

Sr. Duarte de Oliviera contributes a long and interesting article concerning this variety to *Ampelographie*,\* in which, in addition to quoting a good deal of what we have reproduced above, he gives the following information:—

The curious confusion between Bastardo and Pinot is dealt with, it being pointed out how Villa Maior corrected the error—

"Bastardo became included among the Douro varieties without it being possible to say whence it came or why it bears its present name. It has no analogy with foreign sorts, and in our ignorance concerning its origin we are forced to admit that it must be Portuguese; if it is truly so, it is the richest gem in the Portuguese oenological crown, because it is to it especially that Port wine owes its world-wide reputation.

"Though widely distributed throughout Portugal, and everywhere appreciated, it was on the Douro that it played the largest part in the making of wine. In such celebrated vintages as 1834 and 1846 the presence of this grape can be recognised as soon as the bottle is uncorked, even by those who are not professional wine tasters.

"Since the reconstitution of the vineyards, Bastardo has not played so large a part as it formerly did, especially in the hotter parts of the Douro, where the warm sun causes it to shrivel, even before vintage. The neglect of this most valuable vine is deplored, but it is recognised that it was inevitable, since the yield cannot be relied upon—capricious in its production and unable to withstand either thick fogs or the ardent rays of the midsummer sun, the vats would remain almost empty if other comrades more common (*Bourgeois*), but more generous, did not often save the situation. Therefore, on the Douro, in all very sunny aspects, Bastardo has been shown the door; but we must state that no one dares to say, or even to think, that it ought not to co-operate, as formerly, in the making of the great wines. Bastardo is not wanted, but a good souvenir is retained of it. Bastardo has been the great variety which has made the reputation of Port wine.

"Except in Minho (northern Portugal), where it is pruned long, it is usually pruned short. Thus treated, and grafted on vigorous stocks, the bunches are larger than they would otherwise be.

"Bastardo comes into leaf about the same time as other sorts usually grown. Though always an early sort, since it has been grafted on resistant stocks it is even earlier. It is this earliness which is causing it to disappear altogether from the Douro. It also causes it to fall a prey to birds and insects; thrushes in particular do much damage to its fruit. It is a very vigorous vine, and the stem becomes enormous; it resists downy mildew fairly well, but suffers much from Oidium, especially in moist situations.

"Fermentation troubles similar to those referred to by older authorities are mentioned. The fermentation of this grape is exceedingly lazy, extraordinarily slow of accomplishment. Even though the grapes be not over-ripe, the must is always thick and viscous; it is necessary to wait several days and to stir frequently in order to bring the wine to 0 deg. Beaumé, so as to make a table wine. In the case of conversion into Port the vat is racked at 5 deg. or 6 deg. Beaumé. Fermentation then proceeds quicker, because the most difficult stage is the reduction of the gravity from 5 deg. to 0 deg., especially when the original gravity of the must was greater than 12 deg. or 13 deg., as it frequently is at Traz os Montes, and very common with second and third grade wines on the Douro.†

\* Edited by M.M. Viala and Vermorel.

† It is worthy of note that very high Beaumé strength is not considered necessary for the choicer Ports. This is in agreement with the criticism of Australian wines of Port type, by competent wine judges, as being excessively sweet.

"Thus treated, wines result which are rich in sugar, fruity, and preserve a delicate bouquet. As regards Beaumé strength, Bastardo heads the list of red grapes just as Gouveio does that of white. Both these sorts should enter into the making of the best Ports, as they formerly did, because they give regularly musts of an average of 15 deg. Beaumé.

"Bastardo is in some districts grown as a table grape on account of its very early ripening.

The following is the Ampelographical description given by Sr. Duarte de Oliviera :—

*Vine*.—Strong; stem cylindrical; bark reddish-brown; adherent, detaching in short strips.

*Buds*.—Large, swollen, stumpy, with large thick scales; young leaves yellowish-green above, silky-white with small prominent veins beneath.

*Canes*.—Strong, cylindrical, erect, with reddish sepia striations; internodes of very variable length (6 to 12 cm.),\* but rather short than long; knots small; tendrils numerous, short, stout.

*Leaves*.—Large, as broad as long, of medium thickness, soft, light-green and glabrous above, light silky tomentum and paler colour beneath; five-lobed; upper lateral sinus of little depth, narrow and sometimes closed; lower lateral sinus generally not very marked; petiolar sinus deep, closed or almost closed by the two lobes which overlap; veins prominent; teeth large, alternate; those at the extremity of the lobes always more developed; stalk long and of medium thickness. Some days before vintage the leaves assume a reddish tint, in a similar way to the French Teinturier (Tinto), though much less intense.

*Fruit*.—Bunches numerous, small, medium to large on vigorous stocks; cylindrical-conical, often with short wings; capable of shrivelling (becomes raisins) in the sun in a dry season; stalk very short, upper half woody; pedicels thick, very short, with a large swelling; brush (core) short, red in the centre, and detachable with difficulty; berries ellipsoidal, exceedingly tight, superimposed and sometimes flattened by compression; black, with glaucous reflections; flesh juicy, crisp, very sweet, and agreeable to the palate; skin hard; pips per 100 berries—20 with one, 52 with two, 24 with three, and 4 with four each."

\* Equal to 2·3 to 4·7 inches.

(To be continued.)

### LUCERNE FOR HORSES.

According to information gained by the Kansas Agricultural College, and detailed in a bulletin on the subject, there seems to be an almost universal opinion among horsemen, and especially among those that are raising heavy horses, that no grass or combination of grasses equals or even approaches the value of lucerne, alfalfa as it is called, as a pasture for horses. It is maintained that from an economical point of view it has no equal, as it will furnish so much more feed per acre than any other grass. It will not only pasture more horses, but it will produce horses of greater weight, larger bones, and stronger muscles. "A horse that has been reared in an alfalfa pasture and fed a light ration of alfalfa pasture, all winter," says the bulletin, "makes one of the finest horses to be found in any market to-day. To produce a horse of the highest type, with the cleanest bone, the best-developed muscle, the best temperament, and the greatest action and finish, nitrogenous feed must be used, and in no other feed can this most essential element be found more cheaply than in lucerne."

# SIXTH VICTORIAN EGG-LAYING COMPETITION, 1916-1917.

Commenced 15th April, 1916; concluding 14th April, 1917.

CONDUCTED AT THE BURNLEY SCHOOL OF HORTICULTURE BY THE  
DEPARTMENT OF AGRICULTURE, VICTORIA.

## CONCLUSION OF WINTER TEST.

Six Birds.	Owner.	Breeds.	15.4.16 to 14.7.16	15.7.16 to 15.8.16	Total to Date (Four months).	Position in Competi- tion.
Pen No.						

### LIGHT BREEDS.

#### WET MASH.

7	C. J. Jackson ..	White Leghorns ..	367	114	481	1
1	G. McDonnell ..	" ..	344	129	473	2
25	A. H. Mould ..	" ..	356	112	468	
13	H. J. Meadows ..	" ..	347	119	466	4
16	J. H. Duncan ..	" ..	317	140	457	5
40	A. Brundrett ..	" ..	353	98	451	
56	E. W. Hippe ..	" ..	343	108	451	
27	John Blacker ..	" ..	343	103	446	8
41	Excelsior Poultry Farm ..	" ..	327	117	444	9
24	H. N. H. Mirams ..	(5 birds) ..	323	120	443	10
22	Mrs. H. Stevenson ..	" ..	317	123	440	11
33	V. Little ..	" ..	322	110	432	12
28	S. Cheate ..	R.C.N. Leghorns ..	322	105	427	13
37	J. M. Smith ..	White Leghorns ..	330	90	420	
17	W. G. Swift ..	" ..	338	82	420	1
15	G. Laughlan ..	" ..	289	122	411	16
23	T. A. Pettigrove ..	" ..	297	111	408	17
44	J. Jamieson ..	" ..	305	98	403	18
45	C. H. Oliver ..	" ..	272	127	399	19
30	F. T. Denner ..	" ..	285	112	395	20
3	W. M. Bayles ..	" ..	271	122	393	21
14	W. R. Husler ..	" ..	285	107	392	22
34	F. G. Silbereisen ..	" ..	285	99	384	23
32	N. Durston ..	" ..	254	123	377	24
18	C. Ludwig ..	" ..	273	103	376	25
39	L. McLean ..	" ..	248	118	361	26
16	F. Collins ..	" ..	286	70	356	27
26	Mrs. A. Dumas ..	(5 birds) ..	274	81	355	
6	J. J. West ..	" ..	246	119	365	28
12	G. Hayman ..	" ..	250	89	339	30
29	A. S. Irvindman ..	" ..	236	96	332	31
101	A. E. Silbereisen ..	" ..	214	115	329	32
11	R. W. Pope ..	" ..	262	66	328	33
8	E. A. Lawson ..	" ..	206	105	311	34
19	Benwarren Egg Farm ..	" ..	205	97	302	35
43	S. Buscumb ..	" ..	206	92	298	36
5	W. G. Osborne ..	" ..	205	84	289	37
42	Thirkell and Smith ..	(5 birds) ..	205	64	269	38
20	H. Merrick ..	" ..	182	66	248	39
35	Tom Fisher ..	" ..	177	65	242	40
33	E. F. Evans ..	" ..	150	80	230	41
9	W. H. Clinglin ..	" ..	113	112	225	42
4	Fulham Park ..	" ..	90	79	169	43
31	J. H. Gill ..	" ..	82	53	135	44
	Total ..		11,690	4,440	16,130	

### HEAVY BREEDS.

#### DRY MASH.

98	Marville Poultry Farm ..	Black Orpingtons ..	370	139	509	1
97	D. Fisher ..	" ..	312	143	455	2
100	Oaklands Poultry Farm ..	" ..	321	143	464	3
94	Mrs. M. Coad ..	" ..	273	111	384	4
95	T. W. Pearce ..	" ..	232	114	346	5
96	H. Hunt ..	" ..	137	143	280	6
99	J. Ogden ..	" ..	90	91	181	7
	Total ..		1,765	884	2,649	

## SIXTH VICTORIAN EGG-LAYING COMPETITION, 1916-1917—continued.

## Conclusion of Winter Test—continued.

Six Birds. Pen No.	Owner.	Breeds.	15.4.16 to 14.7.16.	15.7.16 to 14.8.16	Total to Date (Four months).	Position in Competition.
LIGHT BREEDS.						
DRY MASH.						
46	W. H. Robbins ..	White Leghorns ..	410	135	545	1
59	T. A. Pettigrove ..	" ..	405	131	536	2
56	Mrs. Nicoll ..	" ..	367	128	495	3
52	W. J. Thom ..	" ..	354	139	493	4
53	W. N. O'Mullane ..	" ..	347	123	470	5
70	G. Wilkinson ..	" ..	335	130	465	6
61	C. C. Dunn ..	" ..	363	91	454	7
58	C. Ludwig ..	" ..	343	105	448	8
65	Izard and Tierney ..	" ..	334	97	431	9
54	Mrs. A. O. Hughes ..	" ..	349	79	428	10
47	H. McKenzie and Son ..	" ..	291	136	427	11
62	J. W. Morrow ..	" ..	320	100	420	12
48	Thirkell and Smith ..	" ..	267	107	374	13
60	E. A. Lawson ..	" ..	240	124	364	14
60	A. Greenhalgh ..	" ..	265	94	359	15
55	Rev. J. Mayo ..	" ..	246	111	357	16
67	Lysbeth Poultry Farm ..	" ..	233	106	339	17
49	C. Lane ..	" ..	265	65	330	18
63	N. Burston ..	" ..	159	137	296	19
51	Reliable Poultry Farm ..	" ..	204	80	284	20
50	Cleveland Poultry Farm ..	" ..	179	97	276	21
66	Deuweren Egg Farm ..	" ..	140	115	255	22
64	A. Bennett ..	" ..	233	17	250	23
65	W. G. Osborne ..	" ..	93	79	172	24
Total ..			6,742	2,524	9,266	

## HEAVY BREEDS

WET MASH.						
74	Oaklands Poultry Farm ..	Black Orpingtons ..	414	156	570	1
80	Brooklyn Poultry Farm ..	" ..	390	126	522	2
87	S. Busenmb ..	" ..	353	124	477	3
92	J. H. Wright ..	" ..	321	152	476	4
85	Mrs. M. Coad ..	" ..	328	138	466	5
83	L. McLean ..	" ..	327	126	453	6
86	C. Ludwig ..	" ..	315	135	450	7
88	A. D. McLean ..	" ..	313	135	448	8
80	Mrs. M. Pearce ..	" ..	315	132	447	9
72	Marville Poultry Farm ..	" ..	334	107	441	10
93	L. W. Parker ..	" ..	303	118	421	11
90	Excelsior Poultry Farm ..	" ..	216	125	371	12
78	Reliable Poultry Farm ..	" ..	245	113	358	13
91	N. Papayanul ..	" ..	206	147	353	14
81	K. Courtenay ..	Faverolles ..	271	71	342	15
77	Mrs. G. R. Bald ..	White Plymouth Rocks ..	217	123	340	16
79	Stranks Bros. ..	White Orps., 4 birds ..	287	40	327	17
73	E. W. Hippe ..	Rhode Island Reds ..	188	112	301	18
54	H. L. Trevans ..	" ..	177	111	288	19
76	L. A. Erry ..	Silver Wyandottes ..	134	139	273	20
71	C. E. Graham ..	Black Orpingtons ..	135	132	267	21
75	Mrs. Drake ..	Rhode Island Reds ..	108	94	202	22
82	J. Ogden ..	Black Orpingtons ..	71	130	201	23
Total ..			6,008	2,786	8,794	

## REPORT FOR MONTH ENDING 14TH AUGUST, 1916.

The weather conditions for the month were seasonable, with heavy winds, varied by occasional frosts and fine days. Several of the heavy breeds showed signs of broodiness; but owing to the time of the year they soon started to lay again.

This year the heavy breed sections are a great improvement on previous years, both in point of quality and egg production; this verdict is borne out by the fact that the world's record for a winter test for all breeds, both light and heavy, has been broken by a pen of six Black Orpingtons, owned by the Oaklands Poultry Farm, which laid 570 eggs, an average of about  $5\frac{1}{2}$  eggs per week for each bird during the four months 15th April to 14th August. Brooklyn Poultry Farm, with a score of 522, obtained second place.

Mr. W. H. Robbins's pen of White Leghorns secured first prize in the winter test for light breeds, with a score of 545 eggs to its credit, while Mr. T. A. Pettigrove's pen was second, with a total of 536 eggs.

The rainfall for the month was 65 points. Temperature—lowest, 32°, highest, 65°.

A. HART,  
Chief Poultry Expert.

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## ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Principal, School of Horticulture, Burnley.

### The Orchard.

#### SPRAYING.

The peach aphid will now have made its appearance in orchards which were not sprayed with the red oil emulsion in the winter. The tobacco solution will now be required, and this may be sprayed on as strongly as the grower wishes. If possible, a second spraying should be repeated quickly after the first operation, so as to kill any aphides previously protected by the others, or any that may have only been weakened by the first operation.

The time has also arrived when spraying is needful for the prevention of all fungus diseases, such as shothole or scab, black spot, leaf rust, leaf curl, &c. In the case of these pests, "prevention better than cure" is the invariable rule; and to delay beyond the correct period the application of the necessary sprays is to court disaster. For black spot of the apple and pear, the spraying should be performed as soon as the earliest flowers are opening. For shothole and scab the time to spray is before the flower petals expand; and the spraying may be repeated, if necessary, after the fruit has set.

For rust and leaf curl the spray should be applied before any sign of the trouble appears on the foliage; thus, if the fungus were present during the previous season, it will be necessary to spray early to combat it successfully.

The basis of all the successful fungicides is sulphate of copper or bluestone. Bordeaux mixture (a mixture of bluestone, lime, and water, known as the 6.4.40 formula), is used; the materials and quantities being 6 lbs. bluestone, 4 lbs. lime, and 40 gallons water.

Another spray, and in some locations equally successful in its results as the Bordeaux mixture, is the copper-soda spray, the proportions being 6 lbs. bluestone, 8 lbs. washing soda, and 40 gallons of water. In each case the materials should be separately dissolved, and then evenly and simultaneously mixed in a third vessel.

It is very urgent that the lime should be thoroughly fresh and quick, otherwise the spray mixture will give very inferior results. A second necessary point is that the copper sprays should be used as soon as they are made. Where the grower does not wish to make his own spray, there are quite a number of ready-made Bordeaux pastes and Bordeaux mixtures already on the market, which can be used with satisfactory results. In fact, the use of these has become fairly general, and it is not now the practice for growers to make their own sprays.

#### GENERAL.

It is most important that ploughing should be completed as early as possible. In the past, it has very frequently happened that, owing to delaying the ploughing, the orchard and the fruit crop have both suffered very considerably. It is absolutely necessary to cultivate the surface early, to take advantage of the moist surface and consequent easy ploughing; and also to conserve as large an amount of moisture in the soil as possible. The longer the ploughing is delayed, the less amount of moisture is retained in the soil for summer use. Deferred ploughing certainly means dry soil, enfeebled trees, and diminished results. Early ploughing gives exactly opposite results; the earlier the ploughing, the more soil water is conserved.

When the ploughing is completed, the clods should be crushed, and the land harrowed, so that a fine earth mulch may be obtained. The orchard surface should be kept as level as possible, and no irregular ridging or furrows should be allowed.

All cover crops planted to supply humus to the soil should now be ploughed in. If the plants are of a leguminous nature, the best time to plough these in is when they are in full flower. If the growth has been at all excessive or rank, the crop may be rolled before ploughing; or it may be cut or mowed with a mowing machine. Every care should be taken that the plants should be distributed evenly over the ground, and large quantities in a mass should not be ploughed under. Artificial and stable manures may also be given to the trees at this time. These should be applied before ploughing.

#### GRAFTING.

The work of grafting should be completed early in the month. The most useful method of reworking old trees is to cut the head right off, leaving only the stump. Then grafts can be put in according to the fancy of the grower. The old method of cleft grafting has been superseded by the bark or crown graft. The latter method does not cause any damage to the wood and thus, with care, no rotting can take place. The best method of bark grafting is the saddle graft; that is, the graft is inserted in the bark and a strip of bark is carried right across the trunk and inserted in the bark on the opposite side. This method is much slower than the ordinary bark graft, but it insures a much quicker healing over the old stump.

#### Vegetable Garden.

The vegetable plots should be cleaned from all weeds, having the light weeds dug in and the stronger ones pulled out and rotted in the compost heap. The surface should be worked up to a very fine tilth after digging; it must be kept constantly loose with the hoe to keep the

soil cool; and prior to digging it will be advantageous to give a top dressing of lime.

If the weather be dry or windy, all newly-planted plants should be frequently watered. In transplanting seedlings, it is a help to dip the whole plant in water before planting.

Any seedlings that are ready may be planted out; tomato plants may be planted out under shelter until the frosts are over. At the end of the month a sowing of French bean seeds may be made. Seeds of peas, broad beans, and beet, cabbage, khol-rabi, and radish, turnip, cauliflower, lettuce, carrot, parsnip, &c., may be sown in the open. Seeds of melons, cucumbers, pumpkins, marrows, and similar plants may be planted in frames for transplanting after the frosts have gone.

### Flower Garden.

After digging, the surface must be kept constantly stirred with the hoe, so as to have it loose and friable for cooling and for moisture-conserving purposes. All weeds must be kept down, as they are robbers of plant food and moisture at this season of the year. Shrubs of all kinds may still be planted out, and these should be well watered after planting. Rose and other aphides must be watched for, and sprayed when they appear. Rose scale should be sprayed with lime sulphur wash or with kerosene emulsion. This pest will soon disappear if the bushes are kept open to admit the air and the sunlight freely. Rose mildew will now be appearing, and the plants, as well as the soil, should be sprinkled with liberal dustings of sulphur. Sulphide of potassium is also a good specific for this fungus trouble, using it at the rate of 1 oz. to 3 gallons of water.

Cannas, early chrysanthemums, and early dahlia tubers may be planted out, as well as all kinds of herbaceous plants, such as delphinium, perennial phlox, asters, &c. These clumps should be well divided, and in planting they should be fed with a liberal quantity of stable manure. Beds should be prepared and well dug over for exhibition chrysanthemums and dahlias.

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## REMINDERS FOR OCTOBER.

### Live Stock.

**HORSES.**—Continue to feed stabled horses well, add a ration of green-stuff. Rug at night. Continue hay or straw, chaffed or whole, to grass-fed horses. Feed old or badly-conditioned horses liberally. If too fat, mares due to foal shortly should be put on poorer pasture. Mares with foals at foot should receive a good ration of oats daily. Those intended for breeding, if not already stunted, should be put to the horse. Colts not intended to be kept as stallions should be gelded. Working horses due for a spell should be turned out to grass.

**CATTLE.**—Except on rare occasions, rugs may now be used on cows at night only. Continue giving hay or straw, if possible, to counteract the effect of green grass. Be prepared for milk fever. Read article in *Year-Book of Agriculture*, 1905, page 314. Give calves a warm dry shed and a good grass run. Continue giving milk at blood heat to calves. Be careful to keep utensils clean, or diarrhoea will result. Do not give too much milk at a time for the same reason. Feed regularly with regard to quantity and time. Give a cup of limewater in the milk to each calf, also place crushed oats or lucerne hay in a trough so that they can eat at will.

**PIGS.**—Supply plenty of bedding in warm well-ventilated styes. Keep styes clean and dry, and feeding troughs clean and wholesome. Sows may now be turned into grass run. Sows suckling young should be well fed to enable them

to produce plenty of milk. Give young pigs pollard and skim milk in separate trough as soon as they will take it, and keep them fattening from the start to get them off as early as possible. Give a tablespoonful of bone meal per 100 lbs. live weight in food daily. If pigs are lousy dress with kerosene emulsion or sulphur and lard, rubbing well into crevices of skin, and disinfect styes. Pig breeding and feeding should be very profitable for a long time to come, and it should be safe to launch out now.

**SHEEP.**—Shear as early as the weather will permit, and avoid the usual excessive dust in travelling to, and yarding at sheds. Burr and seeds collect on the fleeces as well, particularly with lambs, if shearing be left until late in the season. Shear all lambs not fit for export, they thrive better and make more growth through the ensuing summer and autumn. Fleeces from well-bred, good-backed sheep should be skirted with care, the better the class of wool the greater the necessity. Fleeces that have become dead and earthy on the backs need only removing the merest stains, there is little advantage in skirting these. It is better management to have ample tables and extra hands skirting closely than to hastily tear off unnecessary wool and then employ men at other tables to sort "broken fleeces," "first," and "second" pieces, &c. All stains must be removed from ewes' fleeces, and pizzle stains from the bellies of wethers. Keep separate all coarse fleeces from the finer sorts, and in merinoes the yellow and mushy from the shafty and bright. Skirt all hairy thighs from crossbred fleeces. Avoid sending wool to market in long, round-sided bales, known as "sew-downs." Press in a box press, forming square sides. Brand bales neatly, and not with sheep-branding oil, tar, or paint. Stencil plates and branding ink can be obtained on application to the respective brokers.

**POULTRY.**—The bulk of incubation should cease this month—late chickens are not profitable. Devote attention to the chickens already hatched; avoid overcrowding. Feed with dry mash. Also add plenty of green food to ration, ordinary feeding to be 2 parts pollard, 1 part bran, and a little animal food after the first fortnight. Feed ground grain, such as wheat, hulled oats, maize, and peas, which should be fed in hopper to avoid waste. Grit or coarse sand should be available at all times. Variety of food is important to growing chicks; insect life aids growth. Remove brooders to new ground as often as possible; tainted ground will retard development.

#### **Cultivation.**

**FARM.**—Plant main crops of potatoes in early districts and prepare land for main crop in late districts. Fallow and work early fallow. Sow maize and millets where frosts are not late, also mangolds, beet, carrots, and turnips. Sow tobacco beds and keep covered with straw or hessian.

**ORCHARD.**—Ploughing and cultivating to be continued, bringing surface to a good tilth, and suppressing all weeds. Spray with nicotine solution for peach aphid, with Bordeaux mixture for black spot of apple and pear, and with arsenate of lead for codlin moth in early districts.

**VEGETABLE GARDEN.**—Sow seeds of carrot, turnip, parsnip, cabbage, peas, French beans, tomato, celery, radish, marrow, and pumpkins. Plant out seedlings from former sowings. Keep the surface well pulverized.

**FLOWER GARDEN.**—Keep the weeds down and the soil open by continued hoeing. Plant out delphiniums, chrysanthemums, salvia, early dahlias, &c. Prepare ground for digging and manuring for autumn dahlias. Plant gladioli tubers and seeds of tender annuals. Spray roses for aphid and mildew.

**VINEYARD.**—This is the best month for field grafting. If stocks bleed too copiously, cut off 24 hours before grafting. Make sure that scions are fresh. Placing butts in clean water for a few days before grafting is recommended. Field grafts must be staked, to avoid subsequent straining by wind and to insure straight stem for future vine. Stakes are also necessary for grafted rootlings for same reasons. Temporary stakes 3 feet long will suffice. Keep a sharp look out for cut worms. (See *Journal* for July, 1911, and also October, 1913.) Disbud and tie up all vines, giving special care to young plantations. Beware of spring frosts. (See *Journal* for September, 1910.)

Conclude spring cultivation (second ploughing or scarifying and digging or hoeing round vines). Weeds must be mastered and whole surface got into good tilth. Sulphur vines when shoots 4 to 6 inches long.

**Cellar.**—Taste all young wines; beware of dangerous symptoms in unfortified fruity wines, which may need treatment. Fill up regularly all unfortified wines.